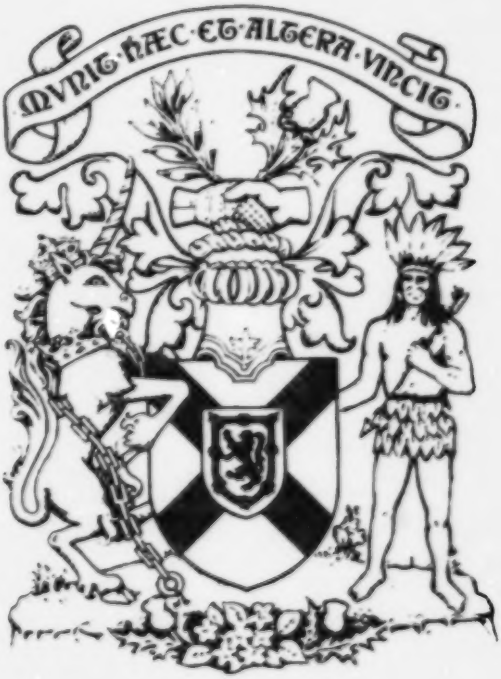
Nova Scotia Department of
LANDS and FORESTS



ANNUAL REPORT
for the year ended march 31 1982

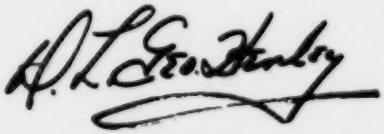
REPORT OF THE
MINISTER OF LANDS AND FORESTS

To His Honour
The Honourable John E. Shaffner,
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the report of the Department of Lands and Forests for the fiscal year ended March 31, 1982.

Respectfully submitted,



D.L. Geo. Henley
MINISTER OF LANDS AND FORESTS

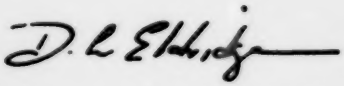
REPORT OF THE
DEPARTMENT OF LANDS AND FORESTS

The Honourable D.L. Geo. Henley
Minister of Lands and Forests
Halifax, Nova Scotia

Sir:

I have the honour of presenting the Report of the Department of Lands and Forests for the fiscal year ended March 31, 1982.

Respectfully submitted,



D.L. Eldridge
DEPUTY MINISTER

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DEPARTMENT OF LANDS AND FORESTS
P.O. Box 698
Halifax, Nova Scotia

MINISTER
Hon. D.L. Geo. Henley
424-4037

DEPUTY MINISTER
D.L. Eldridge
424-4121

DEPARTMENTAL FUNCTION AND ORGANIZATION

The Department of Lands and Forests was established by Legislation enacted in 1926. The Department is charged with administering the Lands and Forests Act and various other statutes, including the Beaches Preservation and Protection Act, the Land Titles Clarification Act and the Provincial Parks Act. From these it derives authority to manage Crown lands, to provide a system of parks, and to protect the forests, wildlife and beaches. Inherent in the Legislation and incumbent upon the Department are responsibilities pertaining to the productivity of the forests generally, the supply of forest products, the conservation of water, and the enhancement of recreational and scenic values. It also assists federal agencies in the enforcement of the Migratory Birds Convention Act.

The functions and activities of the Department are carried out through four branches: Administration, Operations, Program Planning and Land Services.

Administration Branch
424-6694

This Branch is responsible for administrative activities in the areas of Financial Management, Personnel Administration, and the provision of Air Services. Administration also provides for the implementation and administrative control of policies and procedures on behalf of the Deputy Minister and Minister, administrative support for space requirements and buildings and project coordination for the new integrated mobile radio system. The Branch is composed of three divisions.

Financial Management (424-5990) includes budget preparation and control, financial reporting, payment of accounts, the administration and collection of revenue, financial aspects of cost-shared programs, and contract administration.

Personnel Administration (424-8659) covers employee remuneration and benefits, maintenance of employee records, recruitment and selection, organization and establishment, staff training and development, and administration of casual wage rates and policy.

Air Services, P.O. Box 130, Shubenacadie, N.S. B0N 2H0 (758-3438) provides centralized aircraft requirements to all government departments and agencies. Primary functions include forest fire control, air support in emergency situations, resource development, and transportation.

Program Planning Branch
424-4103

The Program Planning Branch is responsible for developing, evaluating, and recommending policy and program alternatives in forest management, park development, wildlife management and forest industry development. The branch is also responsible for the implementation of support programs, including forest nurseries, forest research, silviculture training, education and public information, wildlife parks, aerial insect protection programs and entomological services.

This branch is comprised of four divisions and two subdivisions. The divisions are: Reforestation and Silviculture, Forest Resources Planning and Mensuration; Wildlife; and Parks and Recreation, located in Truro, Kentville and Debert respectively. The Forest Resources Education subdivision is located in Truro and the Forest Industry Development subdivision is in Halifax. Direction in each case is provided from the Halifax Head Office.

The *Reforestation and Silviculture Division*, P.O. Box 68,, Truro, N.S. B2N 5B8 (895-1591) is responsible for planning and directing department programs which effectively increase and improve forest yields within the province. This includes tree breeding, forest nurseries, silviculture training, forest research, entomology, and aerial insect protection programs.

TREE BREEDING CENTRE

Debert, N.S.
B0M 1G0
662-3300

FOREST NURSERIES

Provincial Forest Nursery
P.O. Box 130
Lawrencetown, Anna. Co., N.S.
B0S 1M0
584-2234

Strathlorne Forest Nursery
P.O. Box 489
Inverness, N.S.
B0E 1N0
258-2626

Wittenburg Forest Nursery
P.O. Box 250
Stewiacke, Col. Co., N.S.
B0N 2J0

The *Forest Resources Planning and Mensuration Division,* P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591) is charged with maintaining a continuing forest inventory of all lands, land evaluation, scaling functions and carrying out forest resources planning, which includes Crown land management planning, economic planning and roads engineering.

The *Wildlife Division,* P.O. Box 516, Kentville, N.S. B4N 3X3 (678-8921) is charged with appraising and evaluating the status and population trends of wildlife and inland fish species, and with recommending harvest programs. The division also operates wildlife parks at Shubenacadie (Colchester County), Upper Clements (Annapolis County), and Two Rivers (Cape Breton County), and a fish rearing station at Kelly Lake (Halifax County).

The *Parks and Recreation Division,* RR#1 Belmont, N.S. B0M 1C0 (Debert) (662-3030) is responsible for conducting studies and preparing plans for the orderly development of a provincial parks and trails system as well as the construction program.

The *Forest Resources Education Subdivision,* P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591) is responsible for a comprehensive education and technical information program for the general public and the Department staff.

The *Forest Industry Development Subdivision* (424-7708) identifies, investigates, and analyses development opportunities for wood-using in-

dustries within the province; advises on related support programs; and provides technical advisory service to the sawn products sector.

Operations Branch
424-5826

The Operations Branch is responsible for implementing and maintaining the Department's programs in forest fire control, protection of beaches, fish and wildlife; enforcement of fish and game regulations; management of the Crown lands, including timber sales and forest improvement; administering programs of assistance to private woodland owners, including a management advisory service; constructing and operating provincial parks and other outdoor recreation areas; administering designated game sanctuaries; providing field assistance in planning, data collection and other services in Crown land administration and resource education; and the gathering of statistics on forest resource use.

The branch functions through its senior staff located in Halifax and Shubenacadie and through eight geographical subdivisions.

The Provincial Forest Fire Control Centre, P.O. Box 130, Shubenacadie, N.S. B0N 2H0 (758-2232) is responsible for the acquisition, distribution, and maintenance of fire control equipment, the motor vehicle fleet and heavy equipment. The Fire Control Centre is also responsible for the operation and maintenance of the Integrated Mobile Radio System servicing user departments and agencies of government, hospitals and ambulances, fire departments, and the R.C.M.P.

The province is divided into eight roughly equal geographical subdivisions, each staffed with a resource manager, a Crown lands forester, a private lands forester, and in most cases a biologist. Within the subdivisions are districts headed by supervisors and staffed by forest technicians, field clerks, maintenance personnel and forestry crews. This staff implements the Operations Branch programs.

Operations Field Offices

WESTERN
(Yarmouth, Digby, Shelburne Counties)

10 Starr's Road
Yarmouth, N.S.
B5A 2T1
(742-4196)

P.O. Box 369
Shelburne, N.S.
B0T 1W0
(875-2501)

P.O. Box 367
Digby, N.S.
B0V 1A0
(245-2164)

Kemptville Depot
Kemptville, N.S.
B0W 1Y0
(761-2227)

SOUTH SHORE
(Queens, Lunenburg Counties)

99 High Street
Provincial Building
Bridgewater, N.S.
B4V 1V8
(543-8167)

McGowan Lake Depot
Caledonia, N.S.
(242-2550)

P.O. Box 190
Milton, N.S.
B0T 1P0
(364-3462)

Wiles Lake Depot
Bridgewater, N.S.
(543-2394)

Chester Grant Depot
Chester, N.S.
(275-3574)

VALLEY
(Annapolis, Kings Counties)

120 Exhibition Street
Provincial Building
Kentville, N.S.
B4N 4E5
(678-8907)

P.O. Box 130
Lawrencetown, N.S.
B0S 1M0
(584-2229)

SOUTH CENTRAL
(Halifax, Hants Counties)

Box 23, Site 2
RR#1 Waverley, N.S.
B0N 2S0
(861-2560)

Musquodoboit Harbour, N.S.
B0J 2L0
(889-2332)

Middle Musquodoboit
Nova Scotia
B0N 1X0
(384-2290)

P.O. Box 130
Shubenacadie, N.S.
B0N 2H0
(758-3437)

Stanley Hangar
RR#1 Scotch Village
2G0 B0N
(372-2410)

P.O. Box 190
Windsor, N.S.
B0N 2T0
(798-2016)

Lewis Lake Depot
RR#3 Armdale, N.S.
B3L 4J3
(876-2308)

NORTH CENTRAL
(Cumberland, Colchester Counties)

626 College Road
Bible Hill, N.S.
B2N 2R2
(895-6325)

P.O. Box 130
Oxford, N.S.
B0M 1P0
(447-2115)

P.O. Box 428
Parrsboro, N.S.
B0M 1S0
(254-3241)

EASTERN
(Pictou, Guysborough, Antigonish Counties)

11 James Street
Provincial Building
Antigonish, N.S.
B2G 1R6
(863-4513)

P.O. Box 50
Guysborough, N.S.
B0H 1N0
(533-3503)

RR#2 Aspen
Guysborough Co., N.S.
B0H 1E0
(522-2024)

603 Maritime Building
New Glasgow, N.S.
B2H 2P9
(752-3181)

Antigonish Depot
(863-1502)

Maclellan's Brook Depot
(752-5247)

North Riverside Depot
Guysborough, N.S.
(533-3333)

CAPE BRETON NORTH
(Inverness, Victoria Counties)

P.O. Box 68
Baddeck, N.S.
B0E 2H0
(295-2554)

P.O. Box 130
Whycocomagh, N.S.
B0E 3M0
(765-2339)

CAPE BRETON SOUTH
(Richmond, Cape Breton Counties)

Coxheath Depot
RR#6 Sydney
Nova Scotia
B1P 6T2
(564-6389)

Provincial Building
St. Peter's, N.S.
B0E 3B0
(535-2032)

Land Services
424-5481

The Land Services Branch consists of the following: the Land Acquisition and Regis ry Division, the Surveys Division, and the Provincial Crown Lands Record Centre.

The *Land Acquisition and Registry Division* (424-4267) is responsible for the acquisition and disposal of Crown lands administered by the Department of Lands and Forests and acts on behalf of other departments and agencies in the acquisition and disposal of land. The Division prepares all legal documentation related to deeds, leases, grants, licenses, certificates and letters of authority.

Necessary legal and other documentation for the Beaches Preservation and Protection Act, Land Titles Clarification Act, Land Holding Disclosure Act and Parks Development Act are prepared by the Division. A large number of expropriations are carried out in cooperation with the Expropriating Authority.

All Quieting of Titles Actions are referred to the Division prior to court proceedings to determine if the Department of Lands and Forests has an interest in the action.

The Registry Section of the Division acts as custodian for all Crown land records dating back to 1730. Thousands of inquiries from the public related to land title problems are handled annually.

The Division is responsible for the investigation and settlement of claims to ungranted land.

The primary objective of the *Surveys Division* (424-5020) is to survey, monument and map the Crown lands administered by the Department and to maintain surveyed Crown land boundaries. In addition, it has the following secondary objectives: to survey lands for purchase or expropriation; to provide a drafting and mapping service in support of departmental programs; to survey lands which the Department wishes to protect for environmental, recreational or cultural purposes; to provide a surveying service to other government departments or agencies; and to acquire aerial photography.

The *Provincial Crown Lands Record Centre*, 45 Alderney Drive, Queen Square, Dartmouth (424-8680) coordinates and consolidates information related to all provincial land holdings for all government departments and agencies (including boards, corporations and commissions). It updates the Crown Lands Record and Resource Series Maps; microfilms and stores related deeds, leases and rights-of-way; and provides statistical data for departments and agencies. These data are required to coordinate acquisition and disposal of land and to develop land use policies and plans.

On request, the Provincial Crown Lands Record Centre also provides these types of statistical data and visual display material to the public and to federal or municipal departments and agencies.

Boards, Commissions and Agencies

NOVA SCOTIA FOREST PRACTICES IMPROVEMENT BOARD

Suite 210
Queen Square
45 Alderney Drive
Dartmouth, Nova Scotia
(424-5443)

This Board is responsible for the administration of the Forest Improvement Act. This includes carrying out programs of education for good forest practice, making recommendations for cutting practices, and generally using its authority to encourage better forest management practices on all forested lands in Nova Scotia.

NOVA SCOTIA PULPWOOD MARKETING BOARD

Suite 210
Queen Square
45 Alderney Drive
Dartmouth, Nova Scotia
(424-7598)

This Board is responsible for administration of the Pulpwood Marketing Act. The purpose is to regulate the marketing of pulpwood on behalf of producers and buyers in the province.

LIST OF ACTS ADMINISTERED BY THE DEPARTMENT OF LANDS AND FORESTS

1. Beaches and Foreshores Act
2. Beaches Preservation and Protection Act
3. Blueberry Asociations Act
4. Bowaters Mersey Agreement Act
5. Forest Improvement Act
6. Indian Lands Act
7. Kedgemakooge National Park Act
8. Land Holdings Disclosure Act
9. Land Titles Clarification Act
10. Lands and Forests Act
11. Nova Scotia Pulp Limited Agreement Act
12. Parks Development Act
13. Provincial Parks Act
14. Pulpwood Marketing Act
15. Scalers Act
16. Scott Maritimes Pulp Limited Agreement Act, 1965
17. Surveys Act (not proclaimed)
18. Trails Act (not proclaimed)

ADMINISTRATION BRANCH

FINANCIAL MANAGEMENT

The Financial Management Division develops financial systems and procedures and provides financial information to all Branches of the Department and control agencies of government. They assist in the preparation of the departmental expenditure estimates and prepares the revenue budget. They also manage and process departmental accounts payable, administer the collection of revenue, and are responsible for the distribution and sale of game and fishing licenses.

EXPENDITURES AND REVENUES
1981-82

ORDINARY EXPENDITURES

Administration Branch		
Office of Minister and Deputy	$ 264,512	
Administrative Service	75,445	
Financial Management	582,583	
Game Licenses	151,638	
Personnel and Payroll	146,067	
Legal Services	52,939	
Air Services	935,883	
Grants and Assistance	122,700	
Forest Operators Assistance	875,136	
Forest Practices Improvement Board	51,570	$ 3,258,473
Program Planning Branch		
Administration	$ 135,417	
Branch Administration	70,711	
Forest Industry and Product Development	56,000	
Urban Forestry	311,671	
Education and Information		
Reforestation and Silviculture	1,695,695	
Forest Nurseries		
Forest Resource Planning and Mensuration	225,309	
Mensuration and Office Services	255,004	
Resource Management Planning and Coordination	39,415	
Timber Loan Board	31,007	
Scaling		
Wildlife Management	452,143	
Wildlife Management Planning	183,034	
Inland Fisheries	429,320	$ 3,884,726
Wildlife Parks		

Operations Branch		
Administration		
Branch Administration	$ 497,851	
Silviculture Agreements	174,982	
Field Services		
Field Administration	1,772,795	
Forest Protection	1,793,982	
Enforcement and Hunter Safety	500,833	
Parks Maintenance and Operation	1,268,772	
Extension and Training	86,822	
Private Land Forest Management	858,418	
Wildlife Management	357,571	
Crown Land Forest Management	2,715,796	
Properties, Vehicles and Equipment	694,810	
Provincial Depot		
Administration	132,420	
Fire Control	588,103	
Mechanical Equipment	625,342	
Support Services	224,553	
Radio Communications	613.315	$12.906,365
Land Services Branch		
Administration	52,457	
Provincial Crown Lands Record Centre	229,476	281,933
Total		$20,331,497
*Forestry Subsidiary Agreement		14,662,984
TOTAL		$34,994,481

*Funds budgeted in the Department of Development

CAPITAL EXPENDITURE

Furniture and Equipment		
Office Furniture and Equipment	$ 31,309	
Firefighting Equipment	388,270	
Forestry Equipment	2,822,722	$ 3,242,301
Other		
Parks and Recreation	1,665,998	
Reforestation and Silviculture	835,393	
Insects and Pathogens Protection Program	1,097,883	
Operational Silviculture	445,400	
Forest Resource Planning and Mensuration	604,894	

Crown Land Access Roads	982,890	
Land Acquisition and Registry	3,995,875	
Surveys	2,108,658	11,736,991
*Forestry Subsidiary Agreement		1,029,173
TOTAL		$16,008,465

*Funds budgeted in the Department of Development

REVENUE

Miscellaneous	$ 125,380
Nursery Sale of Trees	643,130
Fines and Forfeitures	79,517
Selective Cutting	1,567,893
Timber and Fuelwood Licenses	2,031,801
Leases and Grants	24,077
Game and Fishing Licenses	1,524,497
Admission Fees - Campgrounds	258,901
	$ 6,255,196

PERSONNEL ADMINISTRATION

The Personnel Administration Division is responsible for personnel and payroll documentation, recruitment and selection, staff training and development, administration of casual rates of pay, employee counselling and grievances and other personnel matters.

The numbers of civil service positions remained relatively constant. During the year between 350 to 800 long-term casual employees were on strength, depending on the time of the year, to assist in full-time programs, or to participate in job creation programs.

The year saw the retirement of Ed Lloyd, Manager, Forest Industry Development at Kentville; Tom Cater, Accountant, Claims and Revenue at Halifax; John Blake, Wildlife Park Attendant at Shubenacadie; George Swanburg, Surveyor at Bridgewater; John Jones, Supervisor, Forest Resources at Waverley; Willard Lynds, Supervisor, Facilities and Equipment at Debert; James Miller, Maintenance Worker at Shubenacadie; and Lee Bushell, Forester at Antigonish.

AIR SERVICES

The Air Services Division is charged with providing centralized aircraft requirements to all government departments and agencies. Primary ac-

tivities of the Air Service include forest fire detection and suppression, emergency situations, resource development and transportation. The fleet includes a mix of fixed and rotary wing aircraft specific to operating needs.

WOOD SALVAGE AND STORAGE AGREEMENT

During the period 280 468 m^3 (stacked) [77,380 cords] of dead and dying pulpwood were harvested on the Cape Breton Highlands and placed in storage at roadside in the Highlands. During the same period 251 341 m^3 (stacked) [69,344 cords] of previously stored softwood were sold to Nova Scotia Forest Industries (N.S.F.I.) for use in their mill. As of March 31, 1982, there were 1 148 804 m^3 (stacked) [316,950 cords] of softwood pulpwood in storage.

Total wood debarked during the period amounted to 113 876 m^3 (stacked) [31,418 cords] (gross less void, rough wood scale), for an overall total of 348 610 m^3 (stacked) [96,180 cords] during the project.

Nova Scotia Forest Industries was contractor for debarking and harvesting wood placed in storage. Wood stored was scaled by a joint N.S.F.I. / Department team and check-scaled monthly by the Chief Scalers for N.S.F.I. and the Department. The original joint scale was used for both purchase and sale of wood. Individual pile location was plotted for all wood in storage. An inventory was taken of wood sold to N.S.F.I. prior to trucking from storage.

The Department cooperated with the Canadian Forestry Service and N.S.F.I. in the assessment of the rate of deterioration of both stored and standing wood damaged in the current spruce budworm infestation.

Wreck Cove Camp was declared surplus by the Department. Three of the five mobile debarkers purchased for the project were sold.

PROGRAM PLANNING BRANCH

FEDERAL PROVINCIAL AGREEMENTS

Negotiations on a new Canada/Nova Scotia Forestry Agreement to supersede the Subsidiary Agreement for Forestry, which expired on March 31, 1982, continued during the year. The Subsidiary Agreement for Forestry has been implemented successfully and a continuation of support by both levels of government is required to maintain the intensive forest management program started under the Subsidiary Agreement. A new accord is expected to be signed during the next fiscal period.

During the year negotiations were conducted on an agreement concerning the coordination of forest research. The primary purpose of this agreement is to ensure that research efforts of the two levels of government are coordinated and complementary. Similar agreements are being negotiated with other provinces and it is expected that an agreement will be signed between Canada and Nova Scotia before the end of 1982.

SPECIAL PROGRAMS

URBAN FORESTRY

In order to generate more interest in intensive management of the forest and related shrubs and green vegetation in the province's urban areas, a forester was assigned to contact representatives from the cities, towns and villages to provide technical advice. This took the form of helping them to set up a tree inventory, providing advice on tree pruning, tree establishment, tree removal and planting. As more communities learn about this service, more are making use of it.

Literature, slides and movies are being accumulated to assist in this promotional program. Plans call for a survey of the municipalities to determine tree care needs, followed by seminars and booklets on tree care. The forester is also responsible for contacting the municipalities to determine the present level of management, sources of funding and the need for implementing and coordinating the Dutch Elm Disease Assistance Program

DUTCH ELM DISEASE ASSISTANCE

History

The Dutch Elm Disease (D.E.D.) was introduced to North America via Ohio in 1930 on some elm logs imported from Europe. It was first noticed

in Canada in 1944 at Sorel, Quebec and was first detected in Nova Scotia at Liverpool in 1969. Since then it has spread and is now found in 11 counties.

Fungus

D.E.D. is caused by a fungus which grows in the living cells of the tree and blocks the movement of moisture, causing part or all of the foliage to wilt and die. The disease is spread by native and introduced bark beetles, which feed on healthy tissues and breed on dead and dying tissues. In the spring and early summer the adults emerge from the breeding places, carrying the spores. Once a tree is infected, the fungus spreads very rapidly, usually killing its host.

Control

There is no known total cure for this disease. But there are control measures which greatly lessen its effects. The City of Fredericton started a control program in the late 1950s which has restricted its losses to about 20%, compared to a loss rate as high as 90% in surrounding areas with no control.

Present methods are aimed at prevention and control. The first objective is to keep elms healthy, vigorous and properly pruned. To achieve this a sanitation program calling for the speedy removal of all dead and dying elms is considered essential. Insecticides and fungicides have been used in some areas as part of a total control package. But because of the high cost and the need for special equipment and trained applicators, their use must be restricted to high value trees.

Assistance

The Nova Scotia Department of Lands and Forests has attempted to assist in controlling the spread of D.E.D. by implementing a sanitation assistance program. At the beginning of the infestation, when the areas are small, contractors remove all infected elm limbs and trees. Infected wood must be burned or buried. In the mid-seventies a three-year assistance program was initiated to provide financial help to the municipalities for sanitation work. In fiscal 1980-81 the Province again provided such assistance.

The present program provides 50% cost-sharing to municipalities to carry out sanitation work on the elm trees. The money is allocated in the following order of priority: (1) municipalities with infected trees; (2) municipalities with trees in the immediate area of infected trees; and (3) to municipalities in other areas.

REFORESTATION AND SILVICULTURE DIVISION

TREE BREEDING

The Department continued its tree breeding activities through its participation in the Tree Improvement Working Group (TIWG). Since 1977, the Department has played a leading role in this joint project in cooperation with Bowater Mersey Paper Company Ltd., Nova Scotia Forest Industries, Scott Paper International, Inc., and the Canadian Forestry Service.

The 1980-81 year was highlighted by the opening of the new Tree Breeding Centre in Debert, Colchester County, and the outplanting of 4.7 ha [11.6 acres] of grafted seed orchard by various TIWG members. The development of the Tree Breeding Centre was funded under the Canada-Nova Scotia Subsidiary Agreement for Forestry.

Tree Breeding Centre

The Tree Breeding Centre was officially opened in Debert, Colchester County, on May 23, 1981, by the Hon. John Roberts, MP, Federal Minister of Environment, and the Hon. George Henley, MLA, Minister of Lands and Forests. A number of Federal, Provincial and Municipal government and industry officials attended the opening which included a tour of the new facilities.

Work continued on nursery development at the Centre. A dam/spillway was constructed to allow the irrigation pond to be used to full capacity. A 836 m^2 [9,000 ft^2] all-season shadehouse was constructed for hardening off and overwintering of greenhouse grown seedlings. A 32 m^2 [340 ft^2] area in one greenhouse was equipped with misting equipment for use in rooting of stem cuttings.

Plus-Tree Selection

To increase the number of trees in the base breeding population, 159 plus trees were selected by Department and company crews in 1981 (see Table below). Selection of plus-trees in white and red spruce is progressing satisfactorily, but selection in black spruce continues to lag. The accepted breeding method for black spruce requires that seed be collected from each plus-tree for use in seedling seed orchards and family tests. Unfortunately, poor seed crops in the last four years have hampered this work.

Results of provenance trials in Norway spruce recently published by the Canadian Forestry Service indicate that seed source selection is very im-

portant in this species, and that seed from the Sudeten and Carpathian Mountains and the northeastern area of Poland is best adapted to most parts of Nova Scotia. Plus-tree selection in this species is now limited to source-identified plantations originating from these provenances.

Scion Collection and Grafting

During the winter, in order to build up first-generation seed orchard acreage as quickly as possible, the annual grafting program was expanded. Company climbing crews collected cutting materials from the tops of 283 plus-trees, and a total of 9,200 grafts were prepared at the Tree Breeding Centre.

Minor changes were made to our grafting methods to increase initial graft survival and growth. To lengthen the effective day-length to 20 hours, high-pressure sodium lighting was used in one greenhouse zone. The results were very encouraging, especially for the more difficult species such as white spruce. Over the past few years, climbing and grafting crews have become quite proficient, and despite the large scale of this year's project, the operation went smoothly.

Approximately 4,300 grafts from last year's operation were outplanted and overwintered in transplant beds at the Centre, with adequate development and minimal losses.

Clonal Seed Orchards

Major grafted seedling outplantings were carried out at three seed orchard locations. Approximately 1.0 ha [2.4 acres] of Norway spruce and 1.1 ha [2.6 acres] of white pine were established at the Department orchard site at Debert. The Nova Scotia Forest Industries orchard site at Waterville had 0.8 ha [1.9 acres] of red spruce established, and the Scott Paper site at East Mines established 1.2 ha [3 acres] of white spruce orchard. A clone bank of 700 grafted trees was established at the Tree Breeding Centre.

The orchards were established 5 x 2.5 m [16.4 x 8.2 ft] spacing, and were computer designed. The trees were fertilized lightly and weed competition was controlled. The orchards were in good condition going into the winter months, with the exception of some foliage reddening at the Waterville site.

With the acquisition of Bowater Mersey of an excellent 40 ha [100 acres] orchard site near Melvern Square, Annapolis County, all members of the TIWG are now actively managing major seed orchard sites.

PLUS-TREE SELECTION TO DECEMBER 31, 1981

	Selected Jan.-Dec. 1981*					Selected Prior to 1981					
Species	L and F	Mersey	NSFI	Scott	Total	L and F	Mersey	NSFI	Scott	Total	Grand Total
wS	3		6(3)	15	24(3)	60	1	84	36	181	205(3)
rS	13	26(6)	1(2)	31(1)	71(9)	55	101	16	102	274	345(9)
bS			22(21)		22(21)	24		71		95	117(21)
wP	1				1	33		2		35	36
jP						20			30	50	50
nS	8				8	12				12	20
TOTALS	25	26(6)	29(26)	46(1)	126(33)	204	102	173	168	647	773(33)

* Figures in brackets indicate additional plus-trees not yet registered for breeding work.

Seedling Seed Orchards

Seedling production for two black spruce seedling seed orchards was started in December 1981. One of these orchards is designed to produce seed for reforestation projects on the highlands of Cape Breton. The seedlings were grown from seed collected from 129 trees selected on the highlands, and 112 additional plus-trees from northwestern New Brunswick. This orchard will be outplanted on an orchard site near Strathlorne, Inverness County in the spring of 1982 by Nova Scotia Forest Industries.

A second black spruce orchard has been started to produce improved seed for the central and eastern mainland, and the lowlands of Cape Breton. Seed for this orchard originated from 99 plus-trees selected in this area of Nova Scotia, and 126 additional trees selected in New Brunswick. This orchard will be outplanted on the Scott Paper, East Mines, Colchester County site in 1982.

Several family tests were started in conjunction with the orchards which will be planted on a variety of sites. These tests will be used to determine the genetic value of each family used in the orchards.

The assistance received through the New Brunswick Tree Improvement Council was invaluable in starting this black spruce orchard program.

Provenance Tests

The rangewide white spruce provenance test, started in cooperation with the Petawawa National Forestry Institute, was lifted from transplant beds at the Provincial Nursery in Lawrencetown, and outplanted at three sites. This test should give a good comparison between seed sources in the Ottawa Valley area, believed to be a superior provenance, and seed sources from Nova Scotia and the other Atlantic Provinces.

Genetic Improvement of Christmas Trees

The Tree Breeding Section initiated a pilot study to determine if plus-tree selection and vegetative propagation techniques could be used to genetically improve the quality of balsam fir planting stock for Christmas trees. A survey was made of several Christmas tree lots in the province, and of 45 plus-trees selected for use in the study.

Cuttings were collected from these trees in mid-January, and established in a misting zone at the Tree Breeding Centre. The 4,250 cuttings were kept separate by clone, shoot type, and crown position, and several root stimulating treatments tested (photoperiod, hormones, rooting

media, etc.). An additional 1,400 cuttings were established from selected 2-2 transplants at Kingsclear, N.B. in cooperation with the New Brunswick Department of Natural Resources. The primary objective is to refine nursery technology for mass-production of planting stock from selected Christmas tree clones.

Genotype-Environment Interaction

A study of genotype/environment interactions in black spruce was expanded to include a large scale field trial. About 30,000 rooted cuttings were started from the seedlings used in the initial greenhouse trial, and will be planted on three test sites in 1983.

Preliminary analysis of the greenhouse study data indicates that the interaction between genotype and soil nitrogen is significant, and that selection of stable black spruce genotypes, identified through multi-location testing, may be required.

Seed Inventory and Testing

All Department-owned tree seed has been transferred to the Tree Breeding Centre for registration and storage. A manual card accounting system is now used to record seed withdrawals and deposits, and all seedlots are now stored in airtight containers at -12° [10° F], and 4-8% moisture content. A regular laboratory testing schedule has been implemented to maintain physical quality and germination vigor.

Miscellaneous

A forester and technician from the Tree Breeding Centre spent two weeks at the National Tree Seed Centre, Petawawa National Forestry Institute, to gain experience in seed handling and testing techniques.

Tree Breeding Centre staff gave numerous tours to professional, educational and general interest groups, and made presentations at a number of service club meetings and special courses.

The senior forester represented the Department and the TIWG at the 18th meeting of the Canadian Tree Improvement Association Meeting in Duncan, British Columbia. Centre staff also participated at New Brunswick Tree Improvement Council meetings, where a healthy spirit of regional co-operation has been generated.

NURSERY OPERATIONS

In April and May 7,026,000 bareroot trees were lifted from the Lawrencetown and Strathlorne nurseries, and a further 3,128,000 were lifted in October and November. Of the fall-lifted stock, 1,495,000 will be shipped in the spring of 1982 and the remaining 1,633,000 will be transplanted. From the Wittenburg nursery 1,204,000 seedlings were shipped in multipot containers.

Thus, total stock lifted and processed during the period was 11,358,000. 8,231,000 trees were shipped, of which 1,200,000 were lifted in the fall of 1980. Also, during the spring field season a total of 3,170,000 seedlings were transplanted.

Distribution for outplanting from the three nurseries was as follows:

Lawrencetown	6,800,000
Strathlorne	227,000
Wittenburg	1,204,000
	8,231,000

Distribution to user agencies in 1981 was as follows:

Crown	1,386,000
Large Private	4,161,000
Small Private	2,610,000
Other	74,000
	8,231,000

Vegetative Production of Highland Black Spruce

The stock from this project is destined for outplanting on the spruce budworm-devastated Cape Breton Highlands. When the 1980 operation trial at Lawrencetown had proven successful, the whole program was transferred to Strathlorne in the fall of 1981.

Seed Collection

In 1981 this Section co-ordinated the collection of 52.4 hectolitres (144.1 bushels) of cones which yielded 81.2 kg (179 lbs) of seed as follows:

Species	Volume hl (bu)	Yield kg (lb)
Balsam fir	6.5 [17.9]	20.0 [44.1]
Red pine	8.4 [23.1]	4.6 [10.1]
White pine	37.5 [103.1]	56.6 [124.8]

In addition we purchased 26.4 kg [58.2 lbs] of red spruce, 68 kg [150 lbs] of black spruce, 90.7 kg [200 lbs] of white spruce and 22.7 kg [50 lbs] of jack pine.

Expansion and Development

This fiscal year has seen expansion, and the near completion of most nursery development projects. The new headerhouse for the Lawrencetown greenhouse complex was completed and modifications were carried out in the pole barn service area and the cold storage pump room.

At Strathlorne, development continued under the Canada/Nova Scotia Subsidiary Agreement for Forestry. Construction was completed on the greenhouses, vehicle storage building and cold storage/administration facility, and a good start has been made on the chemical/dry storage building. A free-standing greenhouse, built for storage purposes, has been converted for use as an additional greenhouse. This increases our total greenhouse space to approximately 4 542 m^2 [48,888 ft^2], and our productive capacity to 5,280,000 seedlings annually.

Gravelling of our main roads, building compound and greenhouse stock holding areas was completed under contract. Landscaping, in the form of sodding and seeding, was continued on various parts of the nursery. Several nursery fields were levelled for nursery use and a second irrigation pond was dug. Most buildings have been or are being made functional; another year should see this nursery fully operational.

At Wittenburg two more free-standing greenhouses have been made operational, giving us approximately 4 330 m^2 [46,608 ft^2] and a productive capacity of 4,396,000 seedlings annually.

Nursery administration and research was responsible for:

- Allocating planting stock equitably
- Consolidating nursery budgets, coordinating cone crop surveys and cone collections
- Carrying out research at all three nurseries
- Overseeing production at the Chignecto Management Unit nursery

- Monitoring progress
- Providing advice and recommendations to staff of the three main nurseries
- Initiating planning for the Northeastern Area Nurserymen's Conference to be held in our province in July, 1982.

ENTOMOLOGICAL SERVICES

There are 21 Pest Detection Officers in the Department of Lands and Forests. These officers collected 260 insect and disease samples. The PDOs also did the sampling for the 1981 spruce budworm egg-mass survey.

The following is information on serious insect and pathogen pests.

Spruce Budworm

The aerial survey of Nova Scotia covered all of Cape Breton Island, Cumberland, Colchester, Pictou, Antigonish, parts of Guysborough County, all of the Annapolis Valley Region and parts of Queens, Shelburne and Hants counties. The level of severe defoliation on Cape Breton Island was 361 300 ha [892,790 acres] in 1980, 292 900 ha [723,771 acres] in 1981, which still is a significant proportion of the remaining forested acres.

The results from the egg-mass survey, 328 samples (266 from Lands and Forests and 62 from Bowater Mersey) indicate a significant reduction in infestations on Cape Breton Island. There is a similar reduction in Pictou, Antigonish, Kings, Annapolis, Hants and Digby counties. For details see Appendix, Tables V and VI.

Tree Mortality:

(a) Balsam Fir

In the Cape Breton Highlands up to 78% of the balsam fir is dead or dying. In survey plots 54% of the trees were dead and 24% were moribund. In the Cape Breton Lowlands the mean mortality of trees was 32% in Richmond County; another 10% are severely stressed. The mean mortality of trees was 21% in Cape Breton County, with another 11% severely stressed.

In Cumberland and Colchester counties the mean mortality of balsam fir is 13% and another 1.5% is severely stressed.

(b) Spruce

Spruce mortality can be the result of either defoliation by spruce budworm and / or stem attack by spruce beetle.

The highest mean mortality of 34% of spruce occurred in Cape Breton County, whereas the lowest (15%) was in Inverness County. Red Spruce and black spruce sustained mean mortality of from 13% in Inverness County to 4.5% in Cape Breton County (Figure 1).

In Cumberland County the mean mortality of spruce is eight per cent.

Mean Mortality of Balsam Fir and Spruce for Counties of Cape Breton Island (including moribund trees)

	Inverness and Victoria			Richmond		Cape Breton	
Year	Highland	Lowland					
	bF & Spruce	bF	S	bF	S	bF	S
1981	78	63	17	42	21	32	39

Gypsy Moth

For the first time an egg-mas of gypsy moth (Lymanthria dispar) was found in Yarmouth. This is the most notorious defoliator of hardwoods in the northeastern United States. In 1981 its area of gross defoliation in the United States was some 3.8 million ha [ll.4 million acres]. It is expected that this insect will become established in Nova Scotia in the near future.

A program of trapping adult males in pheromone sticky traps has been conducted annually by the Forest Insect and Disease Survey in cooperation with personnel of Agriculture Canada, Plant Products and Quarantine, Environment Canada, National Parks and N.S. Lands and Forests. In 1981, 362 pheromone sticky traps were distributed within the province; 21 traps were daily-record traps (see table page 36).

Forest Tent Caterpillar

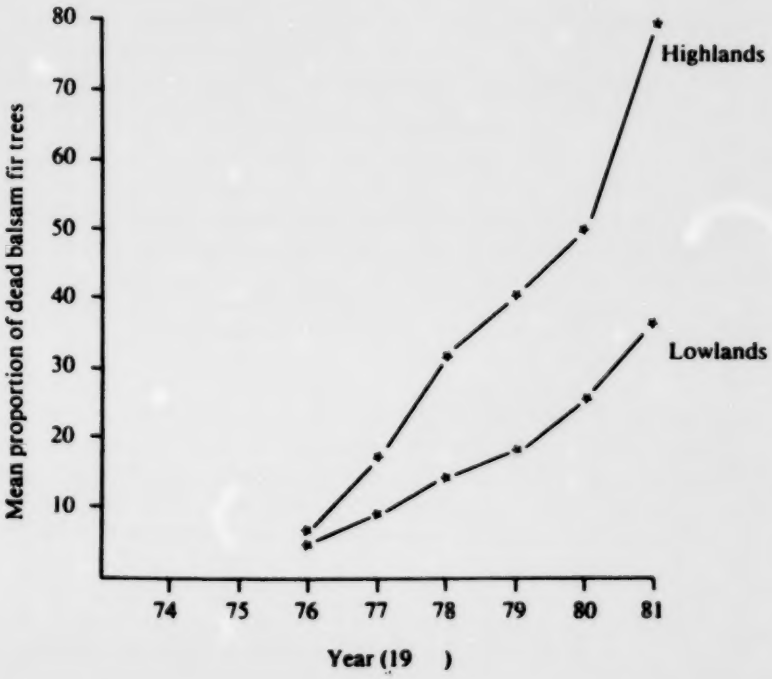
The Forest Tent Caterpillar epidemic is spreading eastward. Large moth flights from the United States and New Brunswick have supplemented increasing local populations. Moth flights were noted in the Yarmouth-

Digby area during the second week of July, 1981. Local defoliation occurred in the Annapolis Valley.

Dutch Elm Disease

Dutch Elm Disease has continued to spread eastward on mainland Nova Scotia and has reached the Town of Antigonish. Southward it was found at Enfield. The beetles are spreading the disease to healthy trees both within and around areas of present infestation, thus intensifying the problem.

FIGURE 1. Mean Proportion of dead balsam fir trees equal to or greater than 10 cm diameter at 4.5 m in permanent sample plots. Cape Breton Island, Nova Scotia, 1981.



1981 GYPSY MOTH TRAPPING AND EGG MASS SURVEY IN NOVA SCOTIA[1]

Trap Area	No. of Traps set	Date set 1981	No. of Traps Picked up	Date of pick up 1981	% Recovery	No. of Traps With GM	Total no. of GM	GM Per trap (avg.)	Egg-Mass Survey Carried Out	Date Egg-Mass Survey 1981	Results of Egg-Mass Survey
Amherst	25	July 7	22	Sept. 14	88	5	14	2.8			
Cape Breton (Cabot Trail)	79	July 9	76	Sept. 10	96	3	4	1.3			
Digby-Annapolis	12	July 8	12	Sept. 7	100	7	15	2.4	•	Nov. 23	Neg.
Halifax-Dartmouth	51	July 9	45	Sept. 9, 10, 11	88	11	14	1.1			
Kejimkujik Park	25	July 8	25	Sept. 7	100	11	14	1.2			
Kentville-Grand Pre	39	July 7	37	Sept. 4	95	9	27	3.0	•	Nov. 23	Neg.
New Glasgow	30	July 8	30	Sept. 9	100	9	10	1.1			
Truro-Glenholme	50	July 6	48	Sept. 8	96	16	21	1.3			
Yarmouth	30	July 9	28	Sept. 8	93	21	231	11.0	•	Nov. 24	1 pupa 1 egg-mass
TOTAL	341		323		95	96	353	3.6			

GM = Gypsy Moth

1. Daily-record trap data not included.

European Pine Shoot Moth

The severe winter of 1980-81 killed most larvae hibernating in exposed shoots of red pine throughout the province. During the summer of 1981 normal shoots were the rule rather than the exception on trees that were severely damaged in previous years.

European Larch Canker

This is a recently found disease in Canada and has been identified in south central Cumberland, central Hants and western Guysborough counties. Small trees, up to approximately 3m [10 ft.) in height are affected in natural regeneration. In some areas most trees are infected. Cankers occur both on branches and stems. The damage potential of this disease in North America is as yet unknown; however, since it is considered a threat to reforestation in parts of Europe, we must consider it as such, unless further investigation indicates otherwise.

FOLIAGE PROTECTION PROGRAM

The spruce budworm was the only forest insect for which an operational foliage protection program was carried out in 1981. The objective of the program was to maintain 50% or more of current foliage of spruce and/or fir in selected areas of Nova Scotia.

Areas

In Cumberland and Colchester counties four foliage protection areas were selected for treatment. In Cape Breton eight foliage protection areas and four cone production areas were selected. The total area treated was 31 195 ha [77,084 acres], 20 666 ha [51,067 acres] in Cape Breton and 10 529 ha [26,017 acres] on the mainland. For details see Appendix, Tables VII, VIII, IX.

The biocide used was a species of bacteria *Bacillus thuringiensis kurstaki* (B.t.k.). The biocide was applied at a concentration of 20 Billion International Units per hectare (BIU per ha). Two commercial formulations of B.t.k. were used -- Thuricide 16B R1 and Dipel 88 R2. Thuricide 16B was applied at an application rate of 7.1 l per ha and Dipel 88 at 5.8 l per ha.

The volume of Thuricide 16B used from Parrsboro was 33 218.7 l and from Crowdis Mountain was 69 192.7 l. The volume of Dipel 88 used from Parrsboro was 5 040.0 l and from Crowdis Mountain was 5 472.0 l.

Aircraft

The aircraft used for applying the biocide were Grumman Ag-cats R models A and B. The A models were stationed at Parrsboro (mainland) and the B models were stationed at Crowis Mountain Airport (Cape Breton). The aircraft flew in formations of three and were supervised by a guidance aircraft.

Foliage Protection

In general the results of the 1981 B.t.k. project can be considered acceptable.

On the mainland the per cent of foliage for spruce saved ranged from 63% in Advocate to 77% in the Economy treatment area. Seventy-one percent of the balsam fir in the Economy Mountain block was saved from defoliation. All areas on the mainland had acceptable foliage protection as defined by the program's objective.

Larval population densities varied from 9.2 to 19.2 per 45 cm branch.

The percent larval mortality ranged from 79.3 to 84.7 in treatment areas (Table VII). Spraying for the mainland began on June 2, 1981 and ended on June 25, 1981.

The situation in Cape Breton is more complex. The effect of the spray is difficult to determine because of the loss of check plots outside the treatment areas due to high defoliation. The data must be analysed and studied in a different manner before any conclusion can be drawn. All that can be said at this point (subjectively) is that foliage has been saved in the treatment areas.

Expenditures

The end of the spruce budworm program's fiscal year is September 30, 1981. The total expenditure of the program was $1,099,378.60. The cost per hectare was $35.54 [$14.39/acre] and the cost per hectare flown was $33.08 [$13.39/acre]. For details see Appendix, Table IX.

SILVICULTURE TRAINING

Chainsaw Instruction

The Subdivision coordinated and gave 18 short (two to five days) chainsaw courses throughout the province. A total of 110 trainees, including

silviculture crews, Department crews and woodlot owners, learned proper maintenance and safe, productive working techniques. For details see Appendix, Table X.

Twenty-five selected Department technicians and foresters in the North Central, South Central and Eastern Subdivisions successfully completed five-day Chainsaw Instructor Courses. All were supplied with manuals and training aids, including flip charts and overhead transparencies. The Subdivision also played an active part in developing and instructing two pilot courses during the year:

(a) a 13-day Forest Worker course at Masstown (Phase 1 of a three-phase program aimed at training and upgrading the forest worker);

(b) A Home Study Course in Chainsaw Use and Safety (aimed especially at woodlot owners and farmers).

Farm Woodlot Management Course

During the fall semester, students taking the Technician program at the Nova Scotia Agricultural College were offered a new course called Farm Woodlot Management. Fifteen students enrolled in the course, which was designed to acquaint students with the farm woodlot resource and how good management procedures could improve its value to the owner.

Soils Course

Eight two-day introductory soils courses were held throughout the province. Approximately 150 technicians and foresters attended. The purpose was to enable them to gain an understanding of the relationship between soils and tree growth—a prerequisite for sound silvicultural prescriptions.

Other Courses

Subdivision personnel participated in an Advanced Christmas Tree Producers Course and a course in the use of Draft Horses for Commerical Forest Operations. Committee work continues in the preparation of a Home Study Course in Silviculture.

Manuals and Visual Aids

Permission was obtained to amend the contents of two Scottish chainsaw instructor's manuals for our local conditions. These lesson plans are a great aid to instructors in giving effective presentations. Silviculture Training continues to produce and supply instructors with visual aids such as flip charts, overhead transparencies and color slides. A third instructor's manual is being produced, and technical help is being given for a 16mm film. Both demonstrate safe, organized and productive working techniques.

FOREST RESEARCH

Experimental Reforestation Trials

In the early 1970s, recognizing the importance of its reforestation program to the future viability of the forest industry, the Department initiated an experimental reforestation and herbicide program. This research has been successful, and is continuing. Its objectives are:

(1) To maximize seedling survival and minimize costs of reforesting barrens, cutovers and burned areas by determining the optimum species (red, white, black spruce; white, red, jack pine; larch; sugar, red maple; white ash, etc.); stock age (2-0, 3-0, 2-2, G1, etc.); stock type (bareroot, multipot, frozen, hot-lifted); stock quality (root-shoot ratio, stem collar diameter, height, etc.) and fertilizer rate and type required.

2) To determine safe outplanting times during the growing season for frozen, hot-lifted, spring-lifted, and container stock.

(3) To find ways to refine prescriptions for reducing operational costs and to increase plantation survival and growth rates.

Since the inception of the program in 1973, more than 200,000 seedlings have been planted by staff of the Forest Research Section. Experimental plantations are measured in the fall of the first year, spring and fall of the second year, and the fall of the fifth, tenth, etc. Trials have been established at Jordan Falls, Mespark Lake, Tener Lake, Stanley, Garden of Eden, Chignecto, Big Barren in Victoria County, Otterbrook, Thompson Station, Urbania, Debert, Trafalgar, Hubley Lake, Cape Breton Highlands and Mount Thom.

Herbicide Trials

Recent departmental projections indicate that, by the mid-1980s, 28 million tree seedlings will be planted annually in Nova Scotia. Plantation surveys show that growth and survival of planted seedlings in many locations are being seriously reduced through competition with dense layers of natural vegetation. Moreover, this competing vegetation provides an ideal rabbit habitat, resulting in either severe mortality or stunting.

The annual cost of planting 28 million seedlings at the rate of 3,000 per ha will be about $6,300,000. To a large degree the future of the existing forest industry depends on the success of these plantations. To protect this investment, economic and environmentally safe and socially acceptable methods are required to control competing vegetation.

The Research Section is testing the newer herbicides, using various methods of application, in order to determine: (i) minimum rates, (ii) the least expensive method(s), and (iii) safe time(s) of application.

To date 23 trials have been established throughout the province using mainly Roundup, Krenite and Garlon. These herbicides are being applied at different rates to different species, using various methods of application including knapsack sprayer, helicopter, spot guns, chainsaw (herbicide mixed in chain oil to prevent sprouting), mist blower, and high volume hand guns. More trials will be established this year.

Mechanical Silviculture Equipment Trials

To minimize the cost of silviculture operations, the Department has initiated a research and development program on silviculture equipment. Throughout the world there is a great deal of silviculture equipment which has not been tested for the province's major site and stand conditions. To date, this limited research has been jointly funded by the Department and industry.

The major objective is to determine what machine(s) will do the best job from an ecological and economic standpoint for each of the major types of sites and stands and forest operations in the province.

To date, a number of trials with various types of equipment have been established, including (i) the TJ30, a feller-delimber-buncher machine capable of harvesting strips as narrow as 15 feet; (ii) a Rome Bedder, a site preparation machine designed to increase the drainage on a site and to prepare it for easy mechanical planting; (iii) the C + H plow used to

prepare sites prior to planting; (iv) Krabat and Holder skidders, narrow machines suitable for skidding wood from thinning operations; (v) the BC cone rake, a device suspended from a helicopter and capable of collecting cones from standing trees; (vi) the TTS trencher, a disc harrow scarifier; (vii) the C + H planter, a mechanical planter capable of planting 800 trees per hour; and (viii) a number of different scrarifiers including the Rome Disc, the Bracke, the Craig Roller, etc.

Variable Density Yield Tables and Models

A series of growth and yield computer models is being developed to determine:

(i) current and expected yields from managed and unmanaged stands,

(ii) when and how much to space stands to produce a particular product in a specific period of time at the least cost,

(iii) ways to match sites to various products,

(iv) equations capable of estimating potential tree growth on the basis of soil texture, moisture, rock type and climatic exposure data.

Data has been obtained from temporary sample plots (TSP's) established in plantations, spaced stands and understocked-untreated stands. Permanent sample plots (PSP's) have been established in plantations and in managed and unmanaged stands to provide the long-term data necessary to check and refine the computer simulation models. These data have been compiled, and a preliminary computer model has been developed. Additional PSP's will be established in plantations and spaced stands.

Direct Seeding Studies

The cost of planting has caused Nova Scotia forest managers to seriously consider other reforestation alternatives. Direct seeding is attractive because it offers a rapid means of regenerating large areas either from the ground or the air, has low labour and supervisory requirements, and can be carried out in the spring, fall or winter. Due to the potential advantages, in particular

the lower costs as compared with planting, ongoing seeding trials have been designed to determine under what conditions various species can be successfully established.

Six of eight such trials were seeded during 1976, 1977 and 1978. The seventh and eighth installations, at Quinan in Yarmouth County and on the Trafalgar Burn, were seeded in the spring of 1979. To date 13 ha [32 acres] have been experimentally sown with 12 different species.

New Uses for Hardwoods

Approximately 71% (69 million cunits) of the growing stock in Nova Scotia is composed of softwood species while hardwood makes up only 29% (30 million cunits). Estimates derived from growth and yield models indicate that, at present production levels, softwood species are being overcut by 10% to 20%, while less than two-thirds of the calculated allowable cut for hardwoods is being harvested. To intensify utilization and management of this resource will call for the development of models capable of predicting future growth and yield of hardwood stands in relation to management inputs, species site and stand factors. These models will provide facts with which to choose the best combination of management alternatives required to maintain or increase the long-term supply of quality hardwoods. This study is funded under the New Uses for Hardwoods Project, Canada-Nova Scotia Subsidiary Agreement for Forestry.

Projected completion date is early 1983, after re-measurement of the 312 permanent sample plots established in 1979.

FOREST NURSERY RESEARCH

To provide nursery managers with the information required to produce suitable stock, continuing research is necessary.

To date a number of projects have been initiated, including:

(i) propagation of black spruce by cuttings
(ii) fertilization trials on container-grown and bareroot seedlings
(iii) frost-heaving reduction trials
(iv) outplanting trials to determine effects of
  (a) storage on growth and survival
  (b) fertilizer levels and seedbed density on growth
  (c) multiple leaders on stem development
(v) shoot and root pruning trials

(vi) shading trials on rising 1/0 seedlings
(vii) transplanting trials
(viii) exploration of degree-day significance for seedling growth
(ix) development of soil moisture curves

Articles published recently by the Research Section include: *Direct Seeding in Nova Scotia,* 1980, P.D. Neily; *Cone Rake Trials in Nova Scotia,* 1981, R.E. Bailey and C.D. Sullivan; *Regeneration of White Spruce Cutovers in Eastern Nova Scotia,* 1979, A. Jablanczy; *Forest Species Associations in Nova Scotia,* 1981, R. E. Bailey and F.R. Wellings.

FOREST RESOURCES PLANNING AND MENSURATION DIVISION

FOREST INVENTORY

General

Forests are a living resource, in constant flux. Therefore, sound forest management requires constantly updated data. One of the best ways to collect and maintain such information is through a recurring inventory. Such an inventory of the province commenced in 1964 with aerial photography of Pictou, Antigonish, and Guysborough counties, followed by photo interpretation, cruising, compilation and reports. By 1971, when photography was complete for all counties, the second cycle began in Pictou, Antigonish and Guysborough counties. Meanwhile the subsequent phases took their courses, all reporting on a 10-year basis so that no data are more than a decade old. The stages are reviewed below in the order of completion.

To provide current data on forest growth and yield, a province-wide system of 1,765 permanent .04 ha [0.1 acre] sample plots is also employed. These are measured every five years. The first remeasurement of the 1965 plots commenced in 1970, the second in 1975.

Aerial Photography

This is contracted to private firms a year before the field work begins. During the spring and summer of 1981, aerial photographs were taken of Hants County and Halifax County (west) using true-color film. From these were produced prints for photo interpretation at a scale 1:10 000. There is a departure from the schedule: Cape Breton Island photography is being postponed due to the continuing spruce budworm infestation and attendant tree mortality.

Field Work

From April to September a crew of 12 men established 2,500 temporary sample plots for estimation of forest volumes in more than 500 stands in Pictou, Antigonish and Guysborough municipality. Data on wildlife habitat are also being gathered. From September to December a crew of 14 men remeasured 250 permanent sample plots across the province.

Compilation and Report

The data from the new inventory are being compiled. The results from the third remeasurement of growth plots have been compiled and an information report is being prepared.

FOREST PRODUCTION

Total commercial forest production for the 1981 calendar year decreased by 13.6% from 1980. Softwood lumber decreased by 9.5%; hardwood lumber increased by 34.3%. Overall lumber production drecreased by 7.7% from 1980.

The number of firms reported as sawing lumber and/or boxwood decreased from 347 in 1980 to 325 in 1981.

Pulpwood exported from Nova Scotia in 1981 decreased by 4% from 1980, i.e. from 242 904 m^3 (stacked) [67,016 cords] in 1980 to 233 052 m^3 (stacked) [64,298 cords] in 1981.

Of the 3 689 213 m^3 (stacked) [130,283,450 $ft.^3$] of primary wood production, sawmills acquired 24% and roundwood users 76%. Of the 895 603 m^3 [31,627,951 $ft.^3$] of primary production processed by sawmills, 301 780 m^3 [10,657,270 $ft.^3$] went to pulp mills as chips from sawmill residue.

Compared to 1980, increases in production were noted for hardwood lumber, pulp chips, railway ties, mine packs, poles and piling, and boxwood. Decreases were reported for softwood lumber, pulpwood, pit props, laths, shingles, staves and heading.

Provincial Crown lands produced 23% of the primary commercial production; large ownerships accounted for 37% and small private ownerships for the remaining 40%.

For details see Appendix, Tables I through IV.

LAND EVALUATION

In order to improve the efficency of our resource management, it is the policy of the Department to purchase land or engage in land trades to consolidate Crown holdings, particularly in the areas of forest management, parks and recreation development and watershed protection. This Section's responsibility is to provide detailed evaluation information for various parcels of timberland offered to the Crown. During the year 15 parcels totalling 7 104 ha [17,549 acres] were cruised for possible purchase or exchange.

SCALING

Check scales were carried out at various firms with cutting agreements on Crown lands. All scalers checked were measuring within acceptable limits.

The Department and Scott Maritimes Ltd. have been carrying out a scaling project to determine conversion factors between mass and volume for both softwood and hardwood pulpwood. This is necessary because stumpage rates in the agreement are quoted at a price per cord but the wood is weighed in metric units. As a result of this project these conversion factors have been revised by mutual agreement. Also a procedure has been developed for further revisions if the conversion factor varies beyond prescribed limits.

In co-operation with Nova Scotia Forest Industries representatives, a periodic check scale was made on the provincial stockpile of budworm-killed wood.

Assistance in instruction was given in various training projects, including the pilot project for forestry workers given by the Commercial Safety College at Masstown, Colchester County. In addition, district staff were helped with scaling projects and problems or complaints.

Provincial Scalers' Examinations and literature were revised and updated. This literature would form the nucleus of a proposed Scaling Manual.

The Annual Timber Scalers School was held at the Agriculture College in Truro with 25 candidates in attendance. The following week 20 candidates attended a refresher course for previously licensed scalers.

FOREST MANAGEMENT PLANNING

General

Several forest management units in the Valley, South Shore, and Western subdivisions were enlarged to incorporate additional Crown land. Approximately 12 142 ha [30,000 acres] were added to the Department's computerized information system, facilitating the planning of forest management activities including silviculture and harvesting.

A new five-year management plan was prepared for the Masonite Canada Ltd. agreement. The plan indicates the locations and quantity of hardwood designated for the mill in keeping with the commitment under the Agreement.

Photo Interpretation

Air photo interpretation involves delineating forested and nonforested areas, then grouping the former by such characteristics as species composition, density class, height class, volume class, forest capability class and silviculture treatment class.

During 1981 photo interpretation was done on Queens, Lunenburg and Halifax counties. Special photo interpretation was done for the first stage of the Provincial Forest Inventory in Hants County and western Halifax County, and numerous smaller interpretation jobs were completed to meet Departmental needs.

Forest Engineering

During the 1981 fiscal year the Forest Engineering group was responsible for the preparation of 11 tender packages, which resulted in the construction of 45 km [28 miles] of forest access road. Three additional tenders were prepared for construction of approximately 8 km [5 miles] of access roads for the Parks Division and for the Strathlorne Nursery. The necessary construction survey layout was also carried out on the above contracts during the 1981 construction season. The Engineering group was also involved in the construction layout of an additional 29 km [18 miles] of roads which were constructed on machine rental basis. A schedule of inspection and monitoring for quality control was carried out on most of the above roads during 1981.

An Access Road Planning and Construction Manual for use on Crown lands completed to the final draft stage. The final text is expected to be completed by mid-1982.

Hydrology reports were carried out on approximately 21 sites throughout the province and in conjunction with bridge and culvert design work.

Under the Roadside Seeding program 41.5 km [25.8 miles] of access roads were seeded for erosion control, as well as 8.1 ha [20 acres] for Parks and Recreation Division, 5.7 ha [14 acres] of rifle ranges and 11.7 ha [29 acres] at the Strathlorne Nursery.

TIMBER LOAN BOARD

Nine loan applications were processed. This entails the locating, field examination and investigation of physical plant and business and preparation and presentation of reports to the Board. These applications came from eight different firms for 17 separate parcels of land covering approximately 1 329 ha [3,281 acres].

The Board accepted eight applications and made loans to six applicants.

The Timber Loan Board's Chief Technician co-ordinated the processing of applications for loans, annual inspections, investigations and reports required in connection with these accounts.

WILDLIFE DIVISION

NON-GAME

Major non-game projects and activities were:

(a) an investigation into the damaging effects of birds on small grains in co-operation with the provincial Department of Agriculture and the Canadian Wildlife Service;

(b) The collecting of additional information of cormorant (shag) food habits in relation to commercial and sports fishing interests;

(c) island seabird inventories and assessment of the long-term impact of a marine oil spill on seabird colonies;

(d) an initial survey of the relationship of domestic livestock to island plant and animal communities

(e) a continuing co-operative program with the forest inventory section to measure wildlife habitat;

(f) monitoring the success of relocating osprey nests from power line poles to substitute nest platforms nearby;

(g) province-wide biweekly counts of overwintering eagles, measuring the numbers and productivity of breeding eagles and studying the wintering eagle population on the Shubenacadie River.

Numerous requests were answered for general non-game information, including many asking for assistance in dealing with nuisance non-game animals. In addition, several minor pest animal complaints were investigated and presentations on non-game animals, wildlife habitat and wildlife habitat planning were made to various public groups and committees.

BIG GAME

Deer

For the 1981 deer season 74,116 resident licenses were sold, 8,994 Senior Citizen licenses were issued and 819 non-resident licenses were sold. Report card returns indicated resident hunter success of 46.9% and non-resident hunter success of 68.2%, for a total estimated harvest of 39,558 deer of which 61.7% were males and 38.3% were females.

The calaculated legal kill by county was:

Kings	1140	Pictou	2605
Annapolis	1908	Antigonish	1034
Digby	1937	Guysborough	3497
Yarmouth	2502	Halifax	3165
Shelburne	1843	Hants	2811
Queens	1867	Cape Breton	1284
Lunenburg	3252	Richmond	980
Cumberland	3924	Inverness	1397
Colchester	3801	Victoria	611

Other known deer mortality resulted in 1,002 dead deer of which 753 were killed by collision with motor vehicles. The unknown illegal kill may be significant and would greatly exceed the known 68 illegal kills.

Bear

A significant drop in nuisance bear complaints, snaring kill and hunter kill suggest an important decline in the black bear population in the province. Only 42 nuisance bear complaints were reported by Department staff during calendar 1981. Of these, 22 were complaints of bear being seen near private property. In two cases, bear were not positively identified, two proved to be something other than bear and one was a report of a bear being hit by a car, leaving 15 complaints in which bears actually did or threatened damage. Eight bears were killed as a result of their involvement in nuisance cases.

Province wide, 979 snaring permits were issued and questionnaire returns from permit holders sampled suggested a kill of 358 bears.

In addition, big game hunter report card returns suggested a hunter kill of 180 bears for a total 1981 kill of 546 bears, a decline of 36.7% from 1980.

Moose

Of the 440 moose license holders in 1981, 161 or 36.6% were successful. The number of licenses issued, moose killed and percent hunter success in each moose management zone were:

Zone	Licenses	Kill	% Success
1	30	15	50.0
2	70	21	30.0
3	30	14	46.7
4	15	5	33.3
5	150	30	20.0
6	75	33	44.0
7	20	15	75.0
8	50	28	56.0
Total	440	161	36.6

The harvest consisted of 99 bulls, 53 cows and nine calves. The mean age of all moose taken was 3.4 years.

Our native mainland moose are of the subspecies *Alces americana*, while the introduced moose on Cape Breton (Zone 8) are of the subspecies *andersonii*. The *andersonii* subspecies is a bit larger than the *americana*. For example, yearling males in *andersonii* averaged 249.4 kg [549.8 lbs.] as

compared to an average of 195.7 kg [431.4 lbs.] in *americana*, based on field dressed weights obtained at registration stations.

FURBEARERS

Furbearer harvesting license sales continued to increase slightly from 5,451 to 5,521 in 1981-82. Since the institution of the furbearer harvesting license, the number of licensed trappers has nearly doubled, from 2,871 in 1976-77 to 5,521 in 1981-82. This has resulted in greatly increased pressure on the furbearer resource across the province. Even though the total revenues to trappers of $1,237,899.00 continues to decrease from the high of $1,862,754.00 in 1978-79, trapper demand on furbearer populations remains high. Harvests of most economically important species remained about the same, or showed some increase. General decline in the average prices paid for most furbearers was primarily responsible for the decline in total revenues.

After a slight decline in 1980-81, raccoon harvests once again increased to a new all-time high this year. However, harvests of both fox and bobcats declined by nearly half in 1980-81. Fox harvests recovered somewhat this year, while bobcat harvests remained about the same. There is considerable concern about overharvest of these furbearers in some areas. Consequently, populations and harvest levels are being closely monitored and some regulatory changes have been proposed. Mink and muskrat harvests both increased. Harvests of beaver remained approximately steady and otter continued to decrease slightly. Harvest of other species declined, with the exception of fisher and coyote. Fisher, re-introduced into several areas of Nova Scotia in 1947-48 and 1963-66, persist as small, sparse populations in areas of re-introductions. Harvest, primarily accidental in traps set for other furbearers, fluctuates at low levels.

Recent investigations indicate that even this small accidental harvest may be adversely affecting the populations, preventing increases above critically low densities. Harvest of coyotes, which only recently invaded Nova Scotia, once again increased this year. Catches on Cape Breton Island show that this furbearer has now spread throughout most of the province. Biological investigations indicate that we can expect continued rapid expansion of the populations in Nova Scotia. The lynx season remained closed, awaiting recovery from the lynx population decline which resulted following the crash of the snowshoe hare population.

Raccoons and muskrats are once again the two top "money makers", accounting for nearly half the total provincial fur value. Other high revenue

furbearers, in order of economic importance are bobcat, fox, mink, beaver, and otter. For data on wild fur exports, see Appendix, Tables XI and XII.

With increasing pressure on furbearer resources, effective management is essential. Current and recently completed studies of various furbearers including bobcat, coyote, fisher and beaver will provide bases for improved management. Together with continued monitoring of population levels and harvests, this should ensure healthy populations for future fur harvests.

The trapper education program was continued in 1981-82 with approximately 75 trappers taking advantage of courses offered. The course held annually in Shubenacadie since 1975 for trappers from all parts of the province was again very successful.

WATERFOWL

Woodcock

Woodcock singing ground surveys conducted by Department personnel in 1981 indicated a slight increase in the number of breeding woodcock. However, harvest data suggests a significant decline in the numbers of birds taken by hunters. Based on weather conditions there was no obvious reason to expect reduced breeding success. We believe the reduced harvest of these birds is related more to an unusual fall migration than it was to poor breeding success.

Waterfowl

Intensive helicopter brood surveys were conducted in Halifax and Hants Counties in 1981. Black duck breeding populations showed a slight province-wide decrease except for the central part of the province, which showed no change. The Cumberland County marshes showed the largest decrease in 1981. Harvest of waterfowl decreased by about one third in the 1981-82 season.

During the year, 734 waterfowl were banded. Of these 373 were black duck, 217 common eider and 85 were Canada geese.

Wetland Inventory

The freshwater wetland inventory field investigations were completed in the fiscal year. Data will be computerised and mapping completed in the next fiscal year. Detailed management plans will be written for top priority wetlands.

Lake Fertilization

The lake fertilization experiment continued. Its purpose is to stimulate wildlife productivity on poor quality wetlands and to offset the impact of acid rain. Although perliminary results have been positive, few sites in the province appear suitable for this type of management.

Significant Wildlife Habitats

In order to make recommendations which if implemented would ensure the maintenance of some of the more important wildlife habitats, Department staff, in conjunction with the Wildlife Habitat Issue Group of the Deputy Ministers' Land Use Committee on Land Use Policy, has been working on the identification and mapping of significant wildlife habitats. These maps are expected to be available by late 1982.

UPLAND GAME

Small Game

Small game license sales dropped from 33,023 in 1980 to 32,642 in 1981, a decrease of approximately 1.2% from last year.

Rabbit hunters took 379,862 animals, compared with 323,336 last year, an increase of 17.5%. The ruffed grouse harvest decreased by less than 1%. The reported harvests of remaining species of small game were all lower than last years. Waterfowl harvests decreased from last year as well. For details see Appendix, Table XIII.

The ptarmigan on Scatarie Island, introduced in 1969, seem to be increasing. The arctic hare are holding their own. Both species are completely protected.

INLAND FISHERIES

Rearing Ponds

A total of 72,450 yearling speckled trout and 8,950 yearling rainbow trout were distributed from the Kelly Lake Fish Culture Station in 1981 (see Appendix, Table XIV). The speckled trout were stocked on a "put and take" basis, as yearlings of about 20 cm [8 in.], in lakes readily accessible to the public. The rainbows are stocked on a "put, grow and take" basis in three accessible lakes.

There are approximately 50,000 speckled trout and 35,000 rainbows being reared for the 1982 distribution.

Lake and Stream Surveys

In all 67 lakes were surveyed in 1981 as part of a continuing inventory program. Our total now includes about 630 lakes and 55 km [34 miles] of stream.

Acid Rain

As part of our lake survey program, detailed water chemistry analysis were carried out on all surveyed lakes in co-operation with the Department of the Environment. One-third of the lakes examined were found to be very sensitive.

Creel Census

The annual creel census to evaluate the returns of various hatchery stocks to an intensive fishery was carried out at Kelly Lake. In addition, a seven-week creel census was conducted in Liscomb Sanctuary. The data collected was comparable to that collected in 1974 and 1975 and indicated a relatively stable fishery.

Sea Trout Project

A two-way fish fence was installed on the South River, Antigonish County, chiefly for monitoring and tagging populations of sea-run trout. This is a co-operative project involving the Department of Fisheries and Oceans and St. Francis Xavier University. The fence will be operated again in 1982.

Mail Survey

Data from a January 1981 mail survey of anglers are now available and a report is being prepared. Results show that in 1980, 66,906 licensed residents fished for 1,487,857 days, and caught 7,145,830 fish. In this pursuit they spent about $20 million. Brook trout accounted for 73% of fishing time.

Calculated Catch

The calculated catch of speckled trout by licensed anglers in 1981 was 1,540,365, or 18.4 fish per licensee.

WILDLIFE AREAS

Provincial Wildlife Parks

The Provincial Wildlife Park at Shubenacadie was open from May 15 to October 15 from 9 a.m. until 7 p.m. The number of visitors increased from former years to 300,000, due mainly to the nationwide publicity on the rearing of an orphan bear cub - "Norma". Canada goose eggs were once again obtained from Ontario and the restocking of Cape Breton Island was continued with the release of 88 birds. In co-operation with Ducks Unlimited, 336 wood ducks were reared and released in the province, as were 565 pheasant chicks.

Upper Clements Wildlife Park also enjoyed another good year with a total attendance of 115,000. Improvement and upgrading is continuing.

Two Rivers Wildlife Park is approaching the final development stage and animals will be placed there in the near future.

Location	Predominant Species	County
Antigonish Harbour	Waterfowl	Antigonish
Debert	Waterfowl	Colchester
Eastern Shore Island	Seabirds	Guysborough-Halifax
Kelly Lake	Salmonids	Halifax
Pearl Island	Seabirds	Lunenburg
Scaterie Island	Ptarmigan, Arctic Hare	Cape Breton
Tobeatic	Beaver	(Digby, Yarmouth, Shelburne, Queens)
Minas Basin	Canada Goose	Kings
Dewey Creek	Waterfowl	Kings

At Manganese Mines in Colchester County the Department manages an outdoor education area.

Provincial Sanctuaries

Debert - Colchester County
Chignecto - Cumberland County
Shubenacadie - Colchester County
Waverley - Halifax County
Sunnybrae - Pictou County
Spectacle Island - Victoria County
Two Rivers - Cape Breton County

Blandford - Lunenburg County
Melborne Lake - Yarmouth County
Martinique Beach - Halifax County
Upper Clements - Annapolis County
Liscomb - Halifax and Guysborough County

PARKS AND RECREATION DIVISION

Background

During the 1981-82 fiscal year the Provincial Park Program continued to play a role in the social and economic development of the province. Through provision of a variety of recreational opportunities within a well-distributed system of parks, the program makes a contribution to the personal well-being and health of the resident population.

Tourism also relies heavily on the availability of public parks which protect and provide access to resource lands, and which contain high-quality facilities for outdoor recreation and heritage appreciation. Provincial parks therefore continue to play an important role in maintaining the image of Nova Scotia as an attractive tourist destination, which in turn improves the opportunity for growth in the industry. In this regard, the continuing emphasis on developing high-quality beach facilities is noteworthy.

Organization

The Provincial Park System is administered by the Parks and Recreation Division in Debert, and the Operations Branch from its eight subdivisions and 21 district offices throughout the Province. The Parks and Recreation Division is responsible for planning the park system and its individual parks, as well as for preparing standards and procedures for development and operation. The Operations Branch is responsible for park maintenance, operation, and policing, and, under guidance from Parks Division staff, does most capital construction. The capital budget is administered by the Parks Division which also manages large construction projects.

The Park System

During 1981, 19 campgrounds, 76 beaches and picnic parks and 31 boat ramps were available for the public. Additional picnic facilities were provided at the Shubenacadie Wildlife Park and at Balmoral Grist Mill. Total operational parkland equalled 6 533 ha (16,143 acres). In addition, 10 959 ha [27,081 acres] were held in reserve for future expansion.

During 1980-81, properties totalling 2 506 ha [6,192 acres] were acquired. Approximately 88% of this was accounted for by the purchase of 2 073 ha [5,123 acres] of the former City of Halifax Watershed lands. Other significant acquisitions were at Cole Harbour and Lawrencetown Beach, and 22.9 ha [56.5 acres] at Petersfield Provincial Park Reserve in Cape Breton County.

Provincial camping parks opened in mid-May, with five closing after Labour Day (116-day season) and 14 closing after Thanksgiving (151-day season). Camping fees were increased to $5.00 per night, and firewood was sold at $1.00 per bundle. Day-use facilities were available to the public at no charge. Total revenue from camping permits was $240,965.

Park Use

The annually-published Campground Use Report recorded that the park system's 1,425 individual campsites accommodated 120,318 persons for 51,808 party-nights. This represented a 16% decline from the previous year. A slight decline in the proportion of Nova Scotia resident visitors (49% to 48%) was also recorded. U.S. visitors, as a proportion of the total user population, increased from 16% to 21%.

Tents remained the most popular form of accommodation among provincial park campers, being used by 48.7%. The remainder used camper vans (17.9%), tent trailers (13.8%), house trailers (13.6%) or other forms of accommodation (6.9%). There were no major shifts in these use patterns from previous years.

Project Planning and Development

Although administered separately, Park Planning and Development are closely interrelated because much of the planning is directed at projects which are funded for implementation within the fiscal year. The total Divisional budget for planning and development was $2,054,000. Capital development projects were funded in 53 parks. This required planning inputs which ranged from site assessments through development of alternative concepts to preparation of detailed site development plans. The development varied from minor projects to complex construction, all of which required direction from Parks Division staff.

Some of the projects are:

PARK	COUNTY	DEVELOPMENT
Beaver Mountain	Antigonish	Picnic area
Caribou	Pictou	Entry building, dump station, landscaping
Saltsprings	Pictou	Camping area, maintenance building, water system
Five Islands	Colchester	Maintenance building, clean-up blowdown
Porters Lake	Halifax	Entry building construction (continued), underground power and septic system installed
Clam Halifax	Halifax	New entry road
Smiley's	Hants	Entry building, gravel road
Gaspereau Lake	Kings	Parking area and boat launch
Blomidon	Kings	Group campsite
Ellenwood Lake	Yarmouth	New camping loop
Sand Hills	Shelburne	Pumphouse and utility building, boardwalk improvement
Iona	Victoria	Toilets, tables, picnic sites
Whycocomagh	Inverness	New entry road, new entry building, parking lot
Mira River	Cape Breton	Day-use access and parking area
Two Rivers Wildlife Park	Cape Breton	Sewer and water, parking lot

Facilities for Handicapped Persons

Facilities designed particularly for the use of handicapped persons were installed in three parks in Halifax County. At Oakfield, a trail was developed. At Taylor Head, access to the beach was provided. At Martinique, toilets and a picnic area suitable for wheelchair access were begun. As well, a bus dropoff area and two parking stalls reserved for paraplegic drivers were installed.

Beach and Shoreline Restoration

In recognition of the recreational significance of the coastline, efforts were made to repair or maintain threatened or damaged coastal resources within

the parks system. Dune restoration and stabilization work was undertaken at Clam Harbour and Sand Hills. At Savary, Digby County, efforts were made to stabilize the shoreline, which has been undergoing serious erosion.

Trails

The Parks and Recreation Division continued its program of trail development, both within established parks and on other areas of Crown land. Trail development was initiated or continued in the following parks: Beaver Mountain, Ellenwood Lake, Five Islands, Taylor Head and Whycocomagh. Trail projects on Crown land comprised these areas: Mabou Highlands, North River, Chebogue Meadows and Economy Falls.

System Planning and Management

In addition to development planning, long-range planning was a major priority. This is directed toward such concerns as the adequacy of the parks system, measurement of supply and demand, preparation of planning guidelines and major park proposals and site evaluations.

An important undertaking was the sponsorship, in co-operation with the Nova Scotia Museum, of a study of the natural history theme regions of the province. The information should provide much of the basis for the education, interpretation and preservation objectives of the parks program.

FOREST RESOURCES EDUCATION SUBDIVISION

The subdivision provides a central education and information service to staff and public. This is carried out through an enquiries desk, literature, a motion picture program and audio-visual library, production of exhibits, posters and signs, special advertising, courses, and walks and talks. This service complements and supports the extension public information function performed by all staff. Full-time staff consists of one forester, one wildlife biologist, one technical writer, an audio-visual supervisor (retiring in May 1982), one field representative and two clerical support staff.

Public demand for information on all aspects of forest resources, especially forests and wildlife, is generally increasing.

Enquiries and Literature

Written and telephoned requests are answered by personal letter or by card, using literature from a list of about 90 titles on hand. Perhaps because of the summer postal strike and increased postal rates, there were fewer

requests than usual--approximately 1,650. This was more than offset by increased demand for the quarterly mini-magazine *N.S. Conservation*, subscriptions for which rose from 15,090 in April to 18,306 at year-end, despite a subscription renewal which culled many names the year before. The mailing list for *Forest Times*, a bimonthly newsletter aimed at woodlot owners and others interested in forest management, stood at 8,012, having virtually recouped a 40% loss occasioned by the 1981-82 subscription renewal. The newsletter is funded under the Canada-Nova Scotia Subsidiary Agreement for Forestry.

New publications prepared wholly or partly by the Subdivision were: *Coping With Coyotes* (folder) and *Life Cycle of the Atlantic Salmon* (leaflet). A revised edition of *Summer Key to the Woody Plants of Nova Scotia* was produced. The children's story *The Man Who Couldn't Stop Sneezing* was completely revised, including new artwork and a new format. Annual commitments included three big game reports, a trapper's newsletter and calendar, *The Forest Products Directory*, summaries of the trapping, hunting and fishing regulations and the annual report of the Department.

Assistance was also given with a folder on the Firearm Hunting Certificate and with another on Ducks Unlimited (Canada) in Nova Scotia. A reprint of the wildlife park folder was prepared, and a coloring sheet for elementary students. National Wildlife Week kits were mailed to all schools.

A special issue of *Forest Times* was distributed in bulk to some 90 high schools in conjunction with the play "The Family Trees".

Teaching With Trees, a handbook for elementary school teachers, was reprinted for use during in-service workshops. Altogether another 2,500 copies of *The Trees Around Us* were distributed by staff and through the Nova Scotia Government Bookstore. Nine issues of the staff newsletter *Woodpecker's Post* were prepared and distributed, and 12 issues of *Woodland Notes* (a collection of press and magazine clippings for persons interested in forest resources).

All told, 192,000 pieces of literature were distributed to staff and public during the year. Department trucks were used instead of regular mail wherever possible.

Support was also provided for the preparation of a history of forestry in the province.

Audio-Visual

Working through the Department of Government Services, the Subdivision makes, on the average, one 16mm motion picture a year. Since these are of varying length and complexity, there is usually more than one in progress.

Filming and scripting for a 16mm motion picture about eagles in Nova Scotia was nearly completed, except for certain difficult shots, which are scheduled for October 1983. Footage was obtained for a 16mm training film on proper felling and bucking technique. Further footage of the Bt bud-worm spray project was obtained for documentation purposes. Footage was also collected to document trespass damage suffered by landowners. A slide-tape set on Department activities was completed.

In the regular motion picture program, conducted province-wide since 1958, 1,006 showings were put on for 81,674 persons, mostly elementary school children. (A showing constitutes one presentation, by appointment, of one or more 16mm films and/or 35mm slides selected for content and audience age-level. Records are kept to prevent undue repetition.) All counties are serviced as time permits by Operations staff, except for Halifax and Hants Counties, which (because of high population density) are handled by one full-time field representative assigned to the subdivision.

This program is backed by a library containing at year-end 465 prints of 257 titles in 16mm, 25 Super 8mm prints of 15 titles, 14 slide-tape sets and a variety of 35mm slides and filmstrips. Forest fire prevention, forest management and wildlife conservation are the main themes. The section also maintains an equipment pool consisting of 14 kits in 20 districts. Each kit consists of 12 films, projectors, screen, blackout curtains and equipment for minor repairs. For major repairs a small shop is maintained.

The biologist prepared several wildlife segments for, and appeared on, CBC Halifax's "Switchback", a television series for children. An estimated 75,000 viewers saw these programs. Taping of the proceedings of the annual N.S. Forest Products Association was done by the supervisor.

Drama

Stage East Theatre Society was again engaged to perform their play "The Family Tree" to high school audiences. This time it was revised to suit senior high and adult audiences. In all, 24,000 students were reached with the play and a half-hour workshop; several community shows were staged also. This presentation was funded under the Canada-Nova Scotia Sub-sidiary Agreement for Forestry.

Exhibits, Posters, Signs

Before the fire season, Smokey Bear fire prevention posters, booklets and handouts were distributed by Department truck and by mail to all field offices. Public information signs were produced for installation at an osprey nest relocation site near Lunenburg, and at an eagle overwintering site near Riverside, Colchester County. Fire hazard signs were provided for several field offices, plus dog/deer awareness signs for winter use on the same posts. Wildlife management area signs were produced for the Provincial Wildlife Park boundaries, and a sign was designed for the new Tree Breeding Centre near Debert.

Meetings were held early in the year with district staff to develop a theme for the fall fair exhibit circuit. Many thousands of fair-goers subsequently visited Department booths featuring information on fuelwood and forest management at Bridgewater, Truro, Middle Musquodoboit, Windsor, Oxford and Caledonia, Queens County. A display on woodlot/wildlife management was also prepared and used at the Sheet Harbour Sportsmans Meet and at the annual meeting of the N.S. Forest Products Association in Truro. A lake surveys exhibit was done for the flyfishing exhibition in Granton, Pictou County. A permanent shorebird exhibit was prepared for Port Morien Wildlife Association, Cape Breton County.

A donation of a model water-driven sawmill was received.

Advertising

A rising incidence of fuelwood theft from roadsides led to the preparation and airing of special 30-second radio ads in October to combat the problem. Assistance was also given to the Lands Resources Coordinating Committee (LRCC) in producing ads to prevent Christmas tree stealing. A *Chronicle-Herald* ad on abuse of private lands was also run in support of the LRCC's campaign on this theme.

A special 16-page *Chronicle-Herald* forestry supplement containing extensive material on the private land forestry program was sponsored under the Forestry Subsidiary, and related smaller ads were run in the *Atlantic Industry and Labour Review* and selected weeklies.

For the ongoing forest fire prevention effort, six radio ads on the importance of obtaining burning permits and on general fire safety were aired from mid-April through mid-July. In addition one animated television commercial was run for five weeks during July and August.

Teacher Training and Curriculum Enrichment

On the principle that if our educators do not understand the purpose and methods of forestry, neither will their students, the subdivision actively promotes teacher training and curriculum aids. During the year the manager put on seven day-long workshops for a total of 105 elementary teachers and 25 high school science teachers. In each case the ease and importance of utilizing schoolyard trees and nearby woodland was stressed. In addition the manager co-instructed a two-week "Teaching Forest Ecology" summer school course (Forestry 216) at the N.S. Teachers College in Truro during August, and assisted with the four-week Truro and Lawrencetown offerings of Forestry 206, the prerequisite course.

Considerable effort was put into completing a school forestry kit sponsored by the N.S. Section of the Canadian Institute of Forestry. The kit, consisting of a teacher's manual and a dozen carefully chosen teaching aids (e.g., aerial photographs, maps, tree auger, wood samples, hand lens), was officially launched at the N.S. Museum in January by the Ministers of Education and Lands and Forests. The kit is available for two-week loans from 14 regional outlets to schools and groups. By June it had been borrowed 66 times. Each kit contains enough materials to grow 30 pine seedlings. (This component gives an index to the degree of actual use.) A smaller kit, on using forest materials for arts and crafts, is being prepared.

Walks and Talks

Nature walks and talks were given to students of St. Mary's School (Truro), St. Peters Junior High and Admiral Westphal School (at Manganese Mines), to Milford Brownie Pack and Kingswood Camp (Antigonish County). Readings were given to 230 students at Old Barns (Colchester County), and to a group of Cubs in Truro. Talks were given to volunteer teachers of the N.S. Museum, to two classes at the N.S. Teachers College and to St. James Men's Club of the Presbyterian Church in Truro.

Miscellaneous

The manager and biologist attended a problem-solving course sponsored by the Public Service Commission. The subdivision was represented at the annual meetings of the Canadian Society of Environmental Biologists, the N.S. Forest Products Association and the Canadian Institute of Forestry / N.S. Forest Technicians Association. Monthly meetings of the LRCC committee were attended by the biologist and / or manager. An article was prepared for and published in the magazine *Canadian Wildlife Administration*. Fifty-four winners were selected from 2,300 posters

submitted to the annual competition sponsored by the N.S. Forestry Association, and 10 from the National Wildlife Week poster contest. Press contacts and a handout were provided for the opening of the new Tree Breeding Centre in Debert. A meeting was held at Coxheath with representatives of the Eskasoni Micmac Band over proposed forest-related courses. A silvicultural and educational assessment of Point Pleasant Park was made at the request of the directors. A thousand tree seed packets were provided for the provincial 4-H forestry program. Several man-weeks were devoted to the new budget system and to the description of duties under the new Hays rating system.

FOREST INDUSTRY DEVELOPMENT SUBDIVISION

The Program

This service provides technical assistance to sawmill operators, and a liaison service with other Provincial and Federal Departments on related matters. The year was one of the slowest in the history of the Forest Products Development program. This was a result of the poor economy and the generally weak market conditions. Nevertheless, over 290 requests for assistance were responded to, providing scaled drawings for sawmill layouts, training, instruction, saw alignment and various other forms of technical assistance.

Personnel

This year saw the retirement of Ed Lloyd from the program after 30 years with the Department of Lands and Forests, half of those with this program.

Exhibits, Courses

Staff attended the Forestry Exhibition in Ottawa, and encouraged Dave Barrett of Barrett Sawmills, Debert, Colchester County, to enter a display at this exhibition. Oxford Equipment also had a display at the exhibition. Two courses (scaling and sawmill technology) were attended.

Studies

A proposal to chip pulp from residues at a central yard was studied with the Department of Development and a group from Tatamagouche. This study proved the project to be uneconomical, so it was dropped.

Considerable work was done on the chipping of low quality or undesirable wood for the industry to be used as fuel. Joe Ueffing from

Canning who is a dealer for the Saturn chip burner from P.E.I. is responsible for the fast-growing interest in this form of alternative energy in the Valley area. Many farmers and large oil users in the Valley are considering the change-over to wood chips.

Construction

Russel Smith in Falmouth, Hants County, lost his sawmill to fire, but rebuilt immediately. McClare Brothers from Hillsvale, Hants County also lost their sawmill. They plan to rebuild sometime in 1982. E.M. Comeau and Sons (1977) Ltd. from Meteghan, Digby County lost their power plant in a fire and rebuilt immediately.

Under Construction

Sawmills under construction for 1982 start-up:

Erfan Lumber	Halifax County
David Thomas and Harold Alexander	Digby County
Laurie Spidel	Lunenburg County

Kilns started in 1981:

Allister D'Entremont	(complete)	Yarmouth County
Bernard Bell	(incomplete)	Digby County
Canwood Ltd.	(since closed)	Lunenburg County

Miscellaneous wood-using enterprises started in 1981:

Acadian Log Cabins	Digby County

New Mills

Sawmills brought in production in 1982 are as follows:

G. Royce Hefler	Halifax County	(replacement)
John McCully	Kings County	(new)
Harold More	Kings County	(new)
Canwood Ltd.	Lunenburg County	(new)
Bill DesChamp	Shelburne County	(replacement)
Frank Noble	Annapolis County	(new)

LAND SERVICES BRANCH

SURVEYS DIVISION

ADMINISTRATION

The administrative staff is comprised of four persons in management along with a support staff of eight. The support group is made up of secretarial services, plan examination and research groups.

One hundred and forty-seven requests were received for technical and legal surveys. The requests came from the various divisions of the Department as well as from other departments of the government. Returns of survey were received for 85 orders issued this year as well as 128 returns for orders issued in previous years. One hundred and eighty-five survey plans were inspected, processed and filed.

The Surveys Division provides plan inspection and, where necessary, field inspection of surveys made by private surveyors under the Forestry Subsidiary Agreement between the Province and the Department of Regional Economic Expansion. During the year, 137 such plans were examined and five field inspections made.

For this period, 79 plans and description were prepared and approved pursuant to Section 30(1) of the Lands and Forests Act. These form part of a certificate of release issued by the Crown, asserting no interest or claim to the corresponding parcel of ungranted land.

The section prepared and called tenders for two vertical color aerial photography contracts. One was for all of Hants County and the western portion of Halifax County at a scale 1:10 000 and the other was for Peggys Cove at a scale of 1:2 500. The Surveys division also provides inspection of condominium plans on behalf of the Registrar of Condominiums. In this period inspection was made on plans of High Rise, Apartment (Block), Apartment (Row) and Town Houses, consisting of 608 units.

During the year the survey staff participated in several continuing education courses. This included courses sponsored by the Canadian Institute of Surveying, taped lectures and courses of study. Two of the division's senior management personnel completed a course in "Communication Skills for Managers" during the winter program of the Advanced Management Center, Institute of Public Affairs, Dalhousie University.

Four Surveys Division surveyors were successful in passing the examinations for Canada Lands Surveyors held in February 1982 and were duly commissioned to practice as Canada Lands Surveyors (C.L.S.). This brings to eight the number of Division surveyors commissioned as both Nova Scotia Land Surveyors and Canada Lands Surveyors.

CROWN LAND SURVEYS

The total area of Crown land surveyed during the year was 10 015 ha [24,747 acres]. This required 332 km [206 miles] of boundary lines, 491 km [305 miles] of trial and tie lines and the placing of 903 survey monuments. To date Crown land surveyed and monumented totals 1 358 520 ha [3,356,971 acres].

Distribution of Crown land surveyed in 1981-82:

County	Hectares	Acres
Antigonish	1	2
Cape Breton	969	2394
Cumberland	610	1507
Digby	39	96
Guysborough	2 082	5145
Halifax	1 196	2955
Inverness	358	885
Lunenburg	20	50
Pictou	221	546
Queens	248	613
Richmond	516	1275
Shelburne	696	1720
Victoria	3 025	7475
Yarmouth	34	84
	10 015	24747

Related survey work includes two surveys for expropriation purposes, two inspections of G.D.A. surveys, nine inspections of boundary line maintenance under the G.D.A. Program, a centre line survey for an airport runway, a survey for a rifle range, six site surveys and plans for architectural purposes, one survey for quantity control, one survey for a sugar bush lease, four surveys for rights-of-way, four lot surveys within a Land Title Clarification Area, a survey to locate the ordinary high water mark in connection with The Beaches Preservation and Protection Act, the cross-sectioning of two beaches for assessment of erosion, the investigation of several road reserves and 10 man-days spent on forest fires.

Boundary Line Maintenance

During the year, 87 km [116 miles] of Crown land boundary line were renewed by Surveys Division staff, and 376 survey monuments replaced. Operations staff assisted in the program and during the year renewed 277 km [172 miles] of boundary and replaced 233 monuments. In total 464 km [288 miles] of boundary was renewed and 609 survey monuments replaced.

SPECIAL PROJECTS SURVEYS

The Special Projects Section is responsible for surveys which generally fall outside the scope of the Crown Land Survey Program. This includes engineering surveys, surveys for land protection, purchases and expropriations.

During the year 51 Special Projects Surveys were completed for the Department, with an additional eight carried out for the Department of Government Services and one for the Department of Transportation. Also, five survey contracts were awarded to Nova Scotia Lands Surveyors in private practice.

MAPPING

The mapping section is composed of three different groups: photogrammetry, cartography and reproduction.

Photogrammetry

This section again employed two photogrammetrists. With the aid of the Division's A-8 stereographic plotter, mapping was completed in manuscript for seven sites throughout the province: Chezzetcook Industrial Park, Crystal Crescent Beach and five park areas: Ellenwood Lake, Laurie, Peggys Cove, Pinehurst and Rissers Beach.

Cartography

The cartographic group employs 10 drafting technicians and is comprised of three units: plotting, special assignments and Crown land property mapping.

The Plotting Section continued developing a series of Forest Inventory Map sheets on the 1:10 000 orthophoto resource base. Plotting was completed on 180 sheets, yielding a new project total of 954 map sheets plotted. In addition 222 orthophoto sheets have been scribed with surveyed

boundary lines and their related Crown post information. This represents completion of the seven eastern mainland counties and the start of Inverness and Victoria counties.

The Special Assignment Unit produced five forest type Crown land maps at a scale of 1:15 840. It also researched, tabulated and updated 221 map sheets showing Nova Scotia Pulp Limited licensed Crown land in the seven eastern counties, and updated 542 maps of the province showing Crown boundary lines. Ten large-scale maps were also produced from manuscripts prepared by the photogrammetry group; six were contour maps of Spruce / Long Lake Watershed lands. Several other projects were undertaken and completed for units of the Department, resulting in approximately 30 special purpose maps.

The Crown Land Property Mapping Unit is responsible for identifying all lands under the administration and control of the Department.

Last year the unit undertook a study to consider switching the Crown land property mapping from the 1:15 840 base to 1:10 000 orthophoto maps. Because this offers only a slight advantage at present, it was decided not to change.

The unit continued working with the Systems and Computer Division of Government Services on the establishment of Crown land cadastral information system. The "Preliminary Design Report" has been drafted and is presently under review. Upon approval of the report, the final program design and the initial data capture process will be started.

Reproduction

The reproduction group is composed of the darkroom, air photo library and map reproduction unit.

The darkroom, using a photomechanical contact process, produces film positives and negatives required by the cartographic group to revise existing plans and to produce orthophoto forest type mapping. In this fiscal year, the darkroom received 29 requests from the orthophoto mapping section and responded by producing 255 diazo sheets and 153 film map sheets. The section also handled 278 other requests. As a result, 64 direct positives were produced for the Surveys Division and 18 for the Land Acquisition and Registry Division. In addition, the group prepared 63 plans of Section 30(1) Certificates and 176 other maps and plans for various sections of Lands and Forests.

The Air Photo Library is stocked with some 177,500 aerial photographs which provide complete coverage of the province from 1927 to the present. The general public are permitted to view the photographs but must order any prints they require from the National Air Photo Library, Ottawa or from M.R.M.S., Amherst, Nova Scotia. The staff dealt with approximately 1,450 requests.

The Map Reproduction Unit is administered by the same staff as the Air Photo Library and has on file almost all the film positives of the departmental map sheets, as well as a set of reproducible orthophoto and large scale urban map sheets provided by the Land Registration Information Service (LRIS) in Summerside, P.E.I.

During this fiscal year, 203 planimetric and 203 topographic urban map sheets were received from LRIS.

Originally the Map Reproduction Unit was created to provide a reproduction service for departmental use only, but it has since expanded to meet the demands from the public and from other government agencies. The demand for prints increased over the previous year, with 10,500 map sheets being provided for departmental use, 7,000 for other government departments and 26,000 sold to the public.

LAND ACQUISITION AND REGISTRY DIVISION

LAND REGISTRY AND RESEARCH

About 2,500 requests from the public, provincial and federal government departments and Department staff were processed. Some 800 required searching Land Registry and Research Records, and about 1,200 required a written reply, along with copies of old records.

The section recorded and/or posted 505 documents: 134 Land Purchases, 26 Disposal Documents, 26 Confirmed Crown Papers; 47 Section 30(1) Certificates, 12 Grant Documents, 27 Lease Documents, 21 Rejected Petitions, 16 Certificates of Title, 110 Survey Plans and 86 Contracts and Agreements.

Reproducible copies (reflexes) of one Old Plan was produced and filed; nine Index Sheets were revised; 214 Petition numbers were issued; 120 drafting assignments were carried out; 591 lots were plotted on aerial photos for the Claims Section, and 46 Quieting of Titles files were dealt with.

Over 3,000 microfilm jackets containing grant document microfilm were replaced. The County Line Portfolio Book was microfilmed and a Special Grant Book was prepared.

A rotary filing reference list has been initiated, and to date around 1,700 plans have been indexed.

LAND ADMINISTRATION

Transfers

The administration and control of five parcels of Crown land were transferred to other provincial departments and to the federal government.

Grants

Thirteen grants were issued involving approximately 680 ha [1,681 acres].

Deeds

Sixteen deeds were issued involving approximately 105 ha [260 acres]

Letters of Authority

Fifty-three letters of authority were prepared for mineral exploration, construction purposes, use of rifle ranges and a variety of domestic purposes.

Beaches

Four areas were designated as Beaches under the Beaches Preservation and Protection Act.

Parks

Six areas were constituted as Provincial Parks under the Provincial Parks Act.

Certificates - Land Titles Clarification Act

Twenty-two Certificates of Title were issued under the Land Titles

Clarification Act. These certificates were issued in the communities of:

NEW ROAD SETTLEMENT	Halifax County
EAST PRESTON	Halifax County
CHERRY BROOK	Halifax County
NEILS HARBOUR	Victoria County
LINCOLNVILLE	Guysborough County
LITTLE DOVER	Guysborough County
DRUMHEAD	Guysborough County
SEAL HARBOUR	Guysborough County
SAMPSON'S COVE (Little Anse)	Richmond County

Certificates - Lands and Forests Act

Forty-eight certificates were issued were issued under Section 30(1) of the Lands and Forests Act. These certificates released the Crown's interest in approximately 4 347 ha [10,737 acres] of land

Tenders

Tenders were called on 18 parcels of Crown land stumpage and 80 parcels of sawlogs, pulpwood, studwood and Christmas trees.

Special tenders were called for sixteen road construction projects, nine tree planting projects, four leases of Crown land, the disposal of two buildings, two budworm spraying projects, and for budworm damage appraisal.

Timber Licenses

Twenty-one timber licenses were issued for cutting Crown land stumpage.

Leases

Twenty-seven leases involving about 44 ha [108 acres] of land were issued:

18 Campsites
2 Recreational
2 Agriculture
2 House lots
1 Camping Park
1 Hangar Site
1 Landfill Site

Rights-of-Way

Two Rights-of-Ways were issued.

Trespass

Six cases of trespass on Crown land were reported and three notices to remove illegal camps were issued.

PROVINCIAL CROWN LANDS RECORD CENTRE

Pertinent information and documents relating to land holdings of 20 government departments and agencies were received by the Centre. To date title, legal and statistical information relating to 22,330 parcels of land have been processed and the loation and land use of the properties plotted on 20-chain line maps and resource series maps. Records of these transactions such as indentures, deeds, abstracts, certificates of title, where available, have been microfilmed and the documents stored.

For details see Appendix, Tables XVI, XVII, XVIII.

OPERATIONS BRANCH

CROWN LAND FOREST MANAGEMENT

CROWN LANDS UNDER WOOD SUPPLY AGREEMENTS

Nova Scotia Pulp Limited, Point Tupper

The 50-year license agreement (wood supply and forest improvement) with Nova Scotia Pulp at Point Tupper involved 506 543 ha [1,251,668 acres] of Crown land in the seven eastern counties, with additional areas being added yearly. By 1986, a total of 607 042 ha [1,500,000 acres] will have been placed under company management.

In the calendar year 1981, 1 167 519 m^3 (stacked) [322,113 cords] of softwood pulpwood and 73 714 m^3 (stacked) [20,337 cords] of hardwood pulpwood were delivered to the mill from Crown lands. Of the softwood pulpwood, 1 060 165 m^3 (stacked) [292,495 cords] were salvaged from blowdown and insect-damaged material. In addition, 6 397 m^3 (stacked) [1,765 cords] of hardwood fuelwood, 2 948 m^3 [520,541 board feet] of softwood sawlogs and 553 m^3 [97,630 board feet] of hardwood sawlogs were produced for sale elsewhere. The agreement calls for an average annual allowable harvest of 1 196 104 m^3 (stacked) [330,000 cords].

Under the federal-provincial Forestry Subsidiary Agreement, funding was available for silvicultural treatments on Crown land. As well, under the company's license agreement, the province returned to the company a stumpage rebate for assistance in future forest improvement work. During 1981 the following treatments were carried out: 1 349 ha [3,333 acres] of planting; 1 866 ha [4,611 acres] of site preparation; 5 531 ha [13,667 acres] of clearcutting; 10 316 ha [25,491 acres] of cutover clearing; 1 098 ha [2,713 acres] of spacing; 3 ha [7 acres] of thinning; 26 ha [64 acres] of remnant removal and 1 446 ha [3,573 acres] of hardwood control.

All harvesting and forest improvement proposals are submitted to the Department for prior approval in the form of Annual Cutting Plans and Annual Silviculture Plans. These show in detail the stands to be harvested or treated silviculturally. Field checks are made by the Department staff before decisions are made. A second check is made by field staff during operations on approved jobs.

Scott Maritimes Ltd., Abercrombie Point

During the calendar year 1981, 84 853 m³ (stacked) [23,410 cords] of softwood pulpwood, 7 193 m³ (stacked) [1,984 cords] of hardwood pulpwood, 25 261 m³ [4,458,630 board feet] of softwood sawlogs, 129 m³ [22,833 board feet] of hardwood sawlogs, 6 963 m³ (stacked) [1,921 cords] of fuelwood and 20 m³ (stacked) [5.5 cords] of fence posts were produced from the 82 153 ha [203,000 acres] under the agreement. The agreement provides for the average production of 181 228 m³ (stacked) [50,000 cords] annually.

Under an annual agreement this company received a stumpage rebate for the performance of silviculture on the licensed Crown land. During 1981, Scott Paper Company carried out the following silviculture treatments on Crown lands: 4 ha [11 acres] of stand conversion; 38 ha [64 acres] of shelterwood cutting; 20 ha [49 acres] of cleaning and 43 ha [107 acres] of planting.

All activities to be carried out on these lands must be submitted to the Department for prior approval in the form of a five-year management plan. This plan must follow the guidelines agreed upon by the company and the Province and show, in general, where operations are to take place, what products are to be extracted, and the proposed road construction. These areas are checked in the field by Department staff, and approval or otherwise is recommended. The annual cutting plan and the annual silviculture plan identify specific locations of various operations.

Masonite Canada Ltd., East River, Lunenburg County

The 10-year stumpage and roundwood sale agreement with Masonite Canada Ltd., signed in December 1976, calls for the Crown to supply the mill with 36 246 m³ (stacked) [10,000 cords] (75% hardwood) on the Company's request. Also the Company can extract 54 368 m³ (stacked) [15,000 cords] annually from Crown land in the counties of Hants, Halifax, Annapolis, Kings, Lunenburg, Queens, Shelburne, Yarmouth and Digby areas especially allocated by the province via five-year management plans. This agreement also requires the Company to submit annual cutting plans for its licensed land. Masonite purchased 21 693 m³ (stacked) [5,985 cords] of contract-cut wood from the Crown, along with 16 133 m³ (stacked) [4,451 cords] of roundwood and 257 m³ [45,343 board feet] of spruce sawlog stumpage.

Riversdale Lumber Company, Truro

This 10-year stumpage agreement, signed in November, 1974, gave the

company the right to cut 162 822 m³ [5,750,000 cubic feet] of wood products in Colchester and Halifax counties during the first five years. For the remaining five years of this agreement the Company is granted the right to cut a maximum of 32 564 m³ [1,150,000 cubic feet] of wood per year (exclusive of any deficiency carried over from the initial five-year period). In 1981 the company cut 27 009 m³ [4,780,626 board feet] of softwood sawlogs, 676 m³ [119,772 board feet] of hardwood sawlogs, 28 076 m³ (stacked) [7,746 cords] of softwood pulpwood, 19 272 m³ (stacked) [5,317 cords] of hardwood pulpwood and 1 838 m³ (stacked) [507 cords] of hardwood fuelwood from their limits.

G. Royce Hefler Limited, Lower Sackville, Halifax County

This license agreement allows the Company to cut a maximum of 1 416 m³ [50,000 cubic feet] of merchantable softwood and hardwood per year so as to include a total of 6 779 m³ [1,200,000 board feet] of sawlogs during the 10-year term of the agreement (September 8, 1977 to September 7, 1987).

During 1981 there were 367 m³ [64,910 board feet] of softwood sawlogs; 195 m³ [34 480 board feet] of hardwood sawlogs and 49 m³ [13.5 cords] of softwood pulpwood cut under this license agreement.

Harry Freeman and Sons Ltd., Greenfield, Queens County

This license agreement signed January 1, 1979, allows the company to cut 1 694 m³ [300,000 board feet] of sawlog stumpage each year during the full term of the agreement. If, during any year of the term of this agreement, the quantities of forest products have not been cut, the company may cut additional quantities of forest products to make up for the deficiency. The maximum quantity of forest products which may be cut by the company in any one year is 2 542 m³ [450,000 board feet] of sawlog stumpage.

In 1981 the company cut 1 763 m³ [312,089 board feet] of softwood sawlogs, 2.9 m³ [508 board feet] of hardwood sawlogs, 1 919 m³ (stacked) [529 cords] of softwood pulpwood and 819 m³ (stacked) [226 cords] of hardwood pulpwood.

Barrett Lumber Company, Sackville, Halifax County

This agreement, signed in August of 1979, allows the company to harvest at least 566 m³ [100,000 board feet] of sawlogs each year until a maximum of 4 196 m³ [742,842 board feet] has been received.

During 1981 Barrett Lumber received a total of 507 m³ [89,845 board feet] of sawlogs.

Alwood Products Limited

This company has been cutting under Letter of Authority on Crown land since 1971. However, an agreement was signed between the Department and the Company on March 9, 1979, giving the Company the right to cut stumpage on Crown land in the Fifth Lake area of Digby County for three years.

During 1981, the company cut 11 485 m³ [2,032,928 board feet] of white pine sawlogs and 722 m³ [136,731 board feet] of other softwood sawlogs.

E.M. Comeau and Sons (1977) Limited, Meteghan, Digby County

This agreement, signed on December 6, 1976, gives the company the right to cut stumpage on Crown land in the Blackadar Brook area of Digby County for a period of 10 years commencing September 1, 1975. During 1981 the company cut 1 691 m³ [299,419 board feet] of softwood sawlogs, 230 m³ [40,696 board feet] of hardwood sawlogs, 565 m³ (stacked) [156 cords] of softwood pulpwood, 489 m³ (stacked) [135 cords] of fuelwood and 174 m³ (stacked) [48 cords] of hardwood lathwood.

Long Lake Lumber Limited, Shelburne

This agreement, signed on December 4, 1979, allows the company to cut stumpage on Crown land in five areas of Shelburne County for a period of 10 years, commencing January 1, 1979. During 1981 the company cut 1 858 m³ [328,957 board feet] of softwood sawlogs.

Caledonia Woodworkers Limited, Caledonia, Queens County

This agreement, signed on August 14, 1979, gives the company the right to cut stumpage on Crown land for a period of 10 years, commencing January 1, 1979. During 1981, the Company cut 1 936 m³ [342,746 board feet] of softwood sawlogs, 55.7 m³ [9,863 board feet] of hardwood sawlogs, 82 567 m³ (stacked) [22,780 cords] of softwood pulpwood, 609 m³ (stacked) [168 cords] of hardwood pulpwood and 205 m [672 feet] of red pine poles.

Elmsdale Lumber Company, Elmsdale, Hants County

Thsi 10-year license agreement signed on May 19, 1977, allows the company

an average maximum annual cut of 6 796 m³ [240,000 cubic feet] of softwood and hardwood.

During 1981 there were 2 839 m³ [502,503 board feet] of sawlogs cut under this license agreement.

Hoeg Brothers Lumber Limited, Athol, Cumberland Company

This agreement, signed on May 6, 1981, gives the company the right to cut stumpage on Crown land for a period of 10 years commencing January 1, 1981.

During 1981, the company received 1 665 m³ [294,827 board feet] of softwood sawlogs and 1 413 m³ (stacked) [390 cords] of studwood under this agreement.

Nova Scotia Forest Products Association Access Road Program

This program, administered by the Association, was initiated in 1967. It provides assistance to forest operators to build access roads for harvesting forest products, to carry out forest improvement work, and to improve access for firefighting. The assistance is in lieu of refunding the tax on gasoline and disesel fuel paid by forest operators for off-highway hauling.

In 1981, 339 km [211 miles] of new forest access roads were built, requiring 134 707 m³ [102,987 cubic yards] of gravel and seven new bridges. Also 222 km [138 miles] of existing roads were upgraded using 26 619 m³ [20,351 cubic yards] of gravel. Assistance totalled $805,000 on 277 claims.

UNLEASED CROWN LANDS

Most of the unleased Crown lands are situated in the central and western parts of the province. The larger units or blocks have been placed under management plans drawn up in consultation with the Forest Planning Branch.

(i) Access roads:
Construction was completed on approximately 96 km [60 miles] of forest access roads, and maintenance carried out on approximately 562 km [349 miles].

(ii) Stand Improvement:
The following stand improvement work was carried out on unleased Crown lands.

STAND IMPROVEMENT

	Hectares	Acres
Planting	583	1,440
Cleaning	148	366
Thinning	101	250
Salvage	48	118
Site Preparation	563	1,391
Remnant Removal	124	306
Cutover Clearing	97	240
Stand Conversion	60	148
Regeneration Cutting	249	615
Crop Tree Release	1	2

FOREST PRODUCTS SALES

Fuelwood Sales

Letters of Authority and standing permits were issued to the many citizens requesting fuelwood. During the calendar year 64 159 m^3 (stacked) [17,701 cords] of fuelwood were cut off unleased Crown land and lands leased to forest industries co-operating with the Provincial Government.

Timber Licenses

Twenty-two timber licenses, granting short-term cutting rights on parcels of Crown land ready to be harvested, were issued to successful tenderers following advertisement.

Sales by Tender (Roadside)

Material produced on Crown land by contracts or by Department crews is usually advertised for sale by tender. The successful bidder is then granted a Letter of Authority to remove the material. During the year 59 parcels of sawlogs, pulpwood, fuelwood and studwood, etc. were sold by Letter of Authority to the highest bidder.

General Letters of Authority

The following types of authorization were given by Letter of Authority: cutting and removal of forest products; aggregate material from beaches and inland deposits, quarried rock, construction of access roads; Christmas tree wreath material; other uses of Crown land on a short term basis. In all 2,113 such letters were newly authorized.

SPECIAL JOB CREATION PROGRAM

To alleviate high unemployment in some areas, the provincial government undertook a summer job creation program. Projects included park maintenance, boundary line re-survey, park development, environmental clean-up, fuelwood cutting and stand improvement. Some 369 jobs were created by the Department under the Provincial Employment Program, Summer Phase.

PRIVATE LAND FOREST MANAGEMENT

MANAGEMENT ASSISTANCE

The Forestry Subsidiary Agreement between the Province and the Federal Department of Regional Economic Expansion was signed on June 28, 1977. Project costs were funded 80% by DREE and 20% by the Province, which was also required to fund staffing and other implementation costs. The Forest Subsidiary Agreement expired March 31, 1982 with provisions for a one-year clean-up period of previous commitments.

Negotiations between the Province and Canada for a new forest agreement are in progress.

Work completed under the Agreement had been expanding each year, as shown below. Group Ventures are not included.

Year	Roads		Boundaries		Pond	Silviculture	
	km	Miles	km	Miles	No.	Hectares	Acres
1977-78	11	7	8	5	1	7 062	17,443
1978-79	109	68	137	85	98	10 262	25,347
1979-80	156	97	623	387	131	12 520	30,924
1980-81	237	147	526	327	162	18 468	45,616
1981-82	248	153	676	418	169	22 496	55,565
Total	*761	*472	1 970	1,222	561	70 808	174,895

* An additional 245 km [152 miles] are under construction.

At the end of the 1981-82 fiscal year the Department had on file a waiting list of 767 applicants for small private plans. Department staff and forestry consultants prepared 493 small private plans to bring the total number to 2,000. In all 157 598 ha [389,267 acres] have been placed under management.

Three pulp and paper companies and three landowners in the 5,000 acres-and-over class continued to be active in the program.

For details see Appendix, Tables XIX, XX, XXI, XXII.

GROUP MANAGEMENT VENTURES PROJECT

During the past three years, especially in 1981-82 the present Forestry Subsidiary Agreement has achieved considerable momentum within the Group service areas.

During 1977-78 and 1978-79 two Groups negotiated and signed agreements with the Province: West Pictou Forest Owners Ltd. and North Nova Forest Owners Co-op. By 1979-80, six additional Groups had signed agreements: Baddeck Valley Wood Producers Co-op Ltd., La Forêt Acadienne Ltée, North Mountain Woodlands Ltd., Sissiboo Forest Management Ltd., Conform Ltd. and Athol Co-operative Ltd.

Our objective is to encourage the assembly of small privately-owned woodlots into large operating areas and to increase the future harvest from these woodlot forests by implementing intensive forest management and marketing practices.

Under a Board of Directors, the shareholder's forest lands are inventoried, treatments prescribed, forest improvements carried out, and forest products marketed.

Operating expenses include cruising, inventory preparation, annual treatment prescriptions, bookkeeping, and office and field administration costs.

Forest improvement expenses include forest services (roads, boundaries, ponds) and silviculture costs undertaken on the ground.

For a summary of areas and activities of each Group with comparisons between 1981-82 and the two previous years, see Appendix, Table XXIII.

Operations

The Groups' foresters cruised 7 902 ha [19,527 acres] of productive and non-productive forest land in the course of preparing 125 forest management plans. The total accumulated area now being managed (as of March 31, 1982) is 36 924 ha [91,241 acres] comprising 593 management plans.

The Groups' operating costs to the Forestry Subsidiary Agreement was $460,450. The Groups contributed an additional $36,775 from the sale of 57 813 m^3[2,041,636 $ft.^3$] of forest products, as compared to $19,140 and 34 006 m^3[1,200,906 $ft.^3$] in 1980-81 and $10,167 and 14 208 m^3[501,780 $ft.^3$] in 1979-80.

Forest Improvements

During 1981-82 the Groups' field supervisors substantially increased forest improvement activities. The groups claimed $1,600,171 for services and silviculture. As a result of these forest services and silviculture treatments some 21 747 m^3 (stacked) [6,000 cords] of wood valued at $140,000 were on inventory as of March 31, 1982. During the year 90 614 m^3 (stacked) [25,000 cords] of wood was harvested with 80% of this wood being sold.

This work involved about 26,000 man-days.

Five-Year Summary

During the five-year agreement (1977-1982) the following was achieved:

Operating:
- 36 923 ha [91,241 acres] cruised and 593 management plans prepared. The merchantable volume under management was 3 253 118 m^3 [114,883,000 $ft.^3$].

- The eight Groups' operating costs during this five-year period were $1,802,036.

Forest Improvements:

Roads:	
- under construction	150.1 km [93.3 miles]
- completed	205.4 km [127.6 miles]
Boundaries:	
- re-established	373.0 km [231.7 miles]
- renewed	716.3 km [444.9 miles]
Fire Ponds:	97
Silviculture:	
- all treatments	3 445 ha [8,153 acres]

The eight Groups claimed $3,795,820 during this five-year period from the Forestry Subsidiary Agreement.

Approximately 66,000 man-days were needed to accomplish this work.

PROTECTION SERVICES

FOREST PROTECTION (FIRE)

The 1981 forest fire season was very light due to wet weather. Across the province 449 fires burned 370.0 ha [914.4 acres] for an average fire size of 0.83 ha [2.04 acres].

NUMBER AND AREA OF FOREST FIRES BY CAUSES, 1980

Cause	No. of Fires	%	Areas Burned Hectares	Acres	%
Smoking	81	18.04	62.24	153.80	16.82
Camp Fire	10	2.23	1.90	4.70	0.51
Incendiary	115	25.62	128.29	317.00	34.68
Power Saw	5	1.11	6.82	16.85	1.84
Slash (Per)	10	2.23	2.85	7.05	0.77
Slash (N.Per)	15	3.34	14.14	34.95	3.82
Land Clearing	23	5.12	11.37	28.10	3.07
Burning Debris	68	15.14	61.03	150.80	16.49
Burning Rt. Way	11	2.45	4.65	11.50	1.26
Locoomotive Sprk.	15	3.34	7.75	19.15	2.09
Other Eng. Sprk.	5	1.11	0.36	0.90	0.10
Miscellaneous	23	5.12	11.39	28.15	3.08
Unknown	66	14.70	57.16	141.25	15.45
Lightning	2	0.45	0.08	0.20	0.02
Total	449	100.00	370.03	914.40	100.00

Over 40% of the fires and 50% of area burned were accounted for during April. However, wet weather characterized the whole fire season.

Aircraft

Aircraft were used very little due to the wet season. Most fires were ex-

tinguished at an early stage with the use of backtanks. Aircraft (hours) time spent on fire duty is summarized below.

	Patrol and Transport	Water Bombing
Beaver DHC2 (1)	66.8	20.5
Cessna 185 (1)	73.6	
Hughes 500 D (1)	164.3	14.1

Helitack

An initial Attack Crew consisting of two five-man units was established in Shubenacadie to work in conjunction with the Bell 212 helicopter and Guffiths "Big Dipper" folding bucket. The primary aim of this team is to go directly to remote fires and undertake initial attack until local crews arrive and take over. During the 1981 season, due to the wet weather, only nine fires were fought by this crew.

Equipment Development

One additional fire truck was constructed in 1980-81, bringing the total provincial fleet of 4x4 ground tankers to 29.

An AGA Thermovision hotspot detector system was purchased in February 1981, but was not used due to the exceptionally wet season.

Training

The film, "Basic Fire Behavior and Suppression", was presented to all new suppression crew members and to most new permanent staff. A course on radio communications was presented by the fire control training officer to all new users of the provincial government system.

Communications

The Provincial Integrated Mobile Radio System has been in use for a year and a half, and serves the following departments and groups:

Network No. 1: Department of Lands and Forests
Network No. 2: Department of Transportation
Network No. 3: Health Care (Hospitals and Ambulances)
Network No. 4: General "Government" users (eg. Emergency Measures Organization, Social Services, Correctional Centres)
Network No. 5: Fire Departments

LAW ENFORCEMENT

In all, approximately 110 Operations personnel were involved in all aspects of enforcement. The Department is completely responsible for the administration and enforcement of the Lands and Forests Act, Part I - Crown Lands, Part II - Conservation of Forests; Parks Act and Regulations; Beaches Preservation and Protection Act and Regulations; and the Forest Improvement Act. However, the Department does receive assistance from the RCMP in enforcing the statues.

The Department shares responsibility with the R.C.M.P. for the enforcement of the Lands and Forests Act, Part III (Game), and the Snow Vehicle Act. The Department also assists the Canadian Wildlife Service and the RCMP in enforcing the Migratory Birds Convention Act and Regulations.

Part I - Crown Lands

The number of persons charged for theft of products from Crown lands decreased in 1981. It would appear the preventive patrols have had an effect in this area.

Part II - Conservation of Forests

Most charges laid under Part II are for causing fire hazards and burning without a permit. Many hours were spent during the fire season investigating fire origins. During 1981 a number of charges were laid against persons for burning without a permit and for permitting fire hazards on their property. However, prosecutions decreased considerably overall.

Part III - Game and Regulations

Staff assisted by the RCMP and Federal Fishery Officers carried out many hours of enforcement. There was a slight increase in prosecutions overall, and a large increase in the prosecutions for "jacking" and related offences. There was a total of 97 in 1980, and this year there were 132 prosecutions. In some cases heavy fines for "jacking" were imposed by the courts. The fine for this offence is $1,000 (minimum) to $2,500 (maximum). In several cases the fines imposed were $1,500 and $2,000, and in one case the vehicle seized by Lands and Forests Wardens was forfeited to the Crown.

Parks Act and Regulations

There were no major problems in the Provincial Parks during 1981. This

could be attributed to the good work of our Wardens who have the prime responsibility of patrolling the parks, with assistance rendered by the RCMP. Charges laid against persons totalled 102 mostly for causing disturbances. This was a decrease of 80 from 1980.

Beaches Preservation and Protection Act

Our personnel are making extra efforts to prevent removal of beach material and to prevent other damage.

Migratory Birds Convention Act and Regulations

There was an increase from 24 charges laid in 1980 to 41 in 1981. Many of these charges were handled by the RCMP and the Canadian Wildlife Service, assisted by our staff.

Snow Vehicles Act

On the rare occasions where violations relate to wildlife, the Department assists RCMP in enforcing this statute.

For a breakdown of charges and offences in all categories, see Appendix, Table XXIV.

HUNTER SAFETY EDUCATION

General

The Hunter Safety Education program continued to be very popular during 1981. On September 1, 1981, legislation was passed making it mandatory for all who had not held a Firearm Hunting Certificate prior to that date to take a course in Firearm Hunter Safety. The new legislature also provided that we would honour firearm courses given by all other provinces, states, and countries, and that anyone holding a Firearm Hunting Certificate from those provinces, states, or countries could obtain a hunting license in Nova Scotia.

Firearm Hunter Safety Course

A total of 11,840 took the course, of which 6,465 were first-time hunters. This was an overall increase of about 5,000 over 1980. Some new instructors were trained to replace those who left the program for various reasons such as transfers, etc.

Bowhunters Safety Education Program

A total of 194 prospective bowhunters took the bow course, and several new instructors were trained.

Hunting Accidents

Hunting accidents decreased again, from 15 in 1980 to 12 in 1981. Fatalities did increase from two in 1980 to three in 1981. For a breakdown of hunting accidents by causes, etc. see Appendix, Table XXV.

TABLE I
COMPARATIVE TABLE OF NOVA SCOTIA TIMBER PRODUCTS
CALENDAR YEARS 1980 AND 1981 (Common Units)

Product	Unit	1980	1981	Increase	Decrease
Lumber, softwood	M fbm.	177,917	161,040		16,877
Lumber, hardwood	M fbm.	7,405	9,946	2,541	
Pulpwood	m^3 (stacked)	5 420 373	4 568 316		852 057
Pulp Chips, Residue	m^3 (stacked)	491 685	495 229	3 544	
Railway Ties	M fbm.	1,399	1,639	240	
Mine Packs	M fbm.	1,551	2,418	867	
Pit Props	M^3 (stacked)	9 332	8 432		900
Laths	Thousand Pieces	6,216	5,697		519
Shingles	Squares	1,074	779		295
Staves and Heading	M fbm.	108	98		10
Poles and Piling	m^3	2 353	2 473	120	
Boxwood	M fbm.	2,957	3,521	564	

TABLE II
FOREST PRODUCTION FROM PROVINCIAL CROWN LANDS BY PRODUCTS
CALENDAR YEAR 1981
COMMON UNITS OF MEASURE

	SAWLOGS (1)		PULPWOOD		FUELWOOD		OTHER PRODUCTS	
COUNTY	Softwood Mfbm.	Hardwood Mfbm.	Softwood m^3 (stacked)*	Hardwood M^3 (stacked)*	Softwood M^3 (stacked)*	Hardwood m^3 (stacked)*	Softwood m^3 (2)	Hardwood m^3 (2)
Pictou	--	--	27 605	27 976	--	2 052	--	--
Antigonish	93	--	13 785	2 307	--	22 888	--	--
Guysborough	26	--	34 929	18 513	776	4 782	--	--
Colchester	3 305	122	24 514	13 955	--	9 181	2	--
Cumberland	569	41	10 953	--	--	13 625	--	--
Hants	1 010	--	10 928	7 746	--	11 914	2 104	--
Halifax	6 453	22	100 114	22 124	--	9 861	--	--
Annapolis	261	44	2 244	2 345	--	6,194	--	--
Kings	115	44	1 292	17 129	--	1 465	--	--
Queens	911	93	6 035	2 710	--	3 501	34	--
Lunenburg	100	27	5 123	4 595	--	5 746	3	--
Digby	2 493	40	916	1 322	--	3 603	--	--
Yarmouth	53	19	1 333	--	--	1 556	--	--
Shelburne	376	--	79	--	274	1 306	--	--
Inverness	--	--	345 586	20 567	--	2 080	--	--
Victoria	--	--	449 547	960	--	3 182	--	--
Cape Breton	--	--	26 431	1 508	--	2 120	--	--
Richmond	10	--	9 134	66	18	4 897	--	--
TOTAL	15 775	452	1 070 548	143 823	1 068	109 953	2 143	--

(1) Sawlogs, studwood, bolts
(2) Solid wood
* m^3 (stacked) equivalent, 8 ft. (2.44 m) bolts

TABLE III
FOREST PRODUCTION FROM PROVINCIAL CROWN LAND BY PRODUCT, CALENDAR YEAR 1981
(m³ SOLID WOOD)

	SAWLOGS		PULPWOOD		FUELWOOD		OTHER PRODUCTS		TOTAL	
COUNTY	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³	Softwood m³	Hardwood m³
Pictou	--	--	16 822	17 048	--	1 250	--	--	16 822	18 298
Antigonish	527	--	8 400	1 406	--	13 947	--	--	8 927	15 353
Guysborough	147	--	21 285	11 281	473	2 914	--	--	21 905	14 195
Colchester	18 717	691	14 938	8 504	--	5 595	2	--	33 657	14 790
Cumberland	3 222	232	6 674	--	--	8 303	--	--	9 896	8 535
Hants	5 720	--	6 659	4 720	--	7 260	2 104	--	14 483	11 980
Halifax	36 546	125	61 007	13 482	--	6 009	--	--	97 553	19 616
Annapolis	1 478	249	1 367	1 429	--	3 774	--	--	2 845	5 452
Kings	651	249	787	10 438	--	893	--	--	1 438	11 580
Queens	5 159	527	3 678	1 651	--	2 133	34	--	8 871	4 311
Lunenburg	566	153	3 122	2 800	--	3 501	3	--	3 691	6 454
Digby	14 119	227	558	806	--	2 196	--	--	14 677	3 229
Yarmouth	300	108	812	--	--	948	--	--	1 112	1 056
Shelburne	2 129	--	48	--	167	796	--	--	2 344	796
Inverness	--	--	210 591	12 533	--	1 268	--	--	210 591	13 801
Victoria	--	--	273 943	585	--	1 939	--	--	273 943	2 524
Cape Breton	--	--	16 106	919	--	1 292	--	--	16 106	2 211
Richmond	57	--	5 566	40	11	2 984	--	--	5 634	3 024
TOTAL	83 338	2 561	652 363	87 642	651	67 002	2 143	--	744 495	157 205

Converting Factors: 1 Mfbm : 200 cu. ft. : 5.663 36 m³ equivalent
1 Cord (8 ft. bolts) : 78 cu. ft. 3.624 56 m³ (stacked) : 2.208 71 m³ solid wood
1 m³(stacked) x 0.609 375 : 1 m³ solid wood

TABLE IV
FOREST PRODUCTION FROM PROVINCIAL CROWN LANDS
CALENDAR YEAR 1981
(m³/ha and cu. ft./acre solid wood)

	PROVINCIAL CROWN LAND TO MARCH 31, 1981		PROVINCIAL CROWN FOREST PRODUCTION			PRODUCTION PER UNIT OF AREA	
COUNTY	Acres	Hectares	Softwood m³	Hardwood m³	Total m³	Per Hectare m³	Per Acre Cu. Ft.
Pictou	102,425	41 450	16 822	18 298	35 120	0.847	12.10
Antigonish	48,148	19 485	8 927	15 353	24 280	1.246	17.81
Guysborough	498,350	201 675	21 905	14 195	36 100	0.179	2.56
Colchester	122,965	49 762	33 657	14 790	48 447	0.974	13.92
Cumberland	151,644	61 368	9 896	8 535	18 431	0.300	4.29
Hants	91,443	37 006	14 483	11 980	26 463	0.715	10.22
Halifax	458,527	185 559	97 553	19 616	117 169	0.631	9.02
Annapolis	102,665	41 547	2 845	5 452	8 297	0.200	2.86
Kings	78,358	31 710	1 438	11 580	13 018	0.411	5.87
Queens	139,373	56 402	8 871	4 311	13 182	0.234	3.34
Lunenburg	90,446	36 602	3 691	6 454	10 145	0.277	3.96
Digby	184,450	74 644	14 677	3 229	17 906	0.240	3.43
Yarmouth	269,021	108 869	1 112	1 056	2 168	0.020	0.29
Shelburne	254,639	103 049	2 344	796	3 140	0.030	0.43
Inverness	301,598	122 052	210 591	13 801	224 392	1.838	26.27
Victoria	336,059	135 998	273 943	2 524	276 467	2.033	29.05
Cape Breton	118,613	48 001	16 106	2 211	18 317	0.363	5.19
Richmond	96,480	39 044	5 634	3 024	8 658	0.222	3.17
TOTAL	3,445,204	1 394 223	744 495	157 205	901 700	0.647	9.24

TABLE V
SUMMARY OF AREAS OF SPRUCE BUDWORM DEFOLIATION* IN NOVA SCOTIA, 1978 TO 1981

Sector of Province	Year	DEFOLIATION CATEGORIES (hax 1000) Light	Moderate	Variable	Severe
Cumberland	1978	3.2	20.3	0	74.5
Colchester	1979	3.6	17.8	0	77.0
	1980	3.2	66.0	45.8	102.1
	1981	40.8	31.8	-	69.0
Northumberland	1978	10.9	11.7	0	1.2
Coast	1979	31.6	8.9	0	15.8
	1980	13.8	1.2	56.3	7.3
	1981	13.5	11.0	-	1.6
Annapolis	1978	0	0	0	0
Valley	1979	20.7	11.3	0	9.7
	1980	40.1	36.0	0	21.5
	1981	46.9	42.0	-	47.3
Cape Breton	1978	0	68.9	203.3	376.7
Island	1979	164.4	129.6	339.4	256.8
	1980	47.4	121.1	456.8	361.3
	1981	31.8	71.4	-	292.9

Total area of all categories of defoliation (thousands of hectares)	1978	1979	1980	1981
	771	1 087	1 380	700

* From maps developed from aerial surveys of spruce budworm defoliation.

TABLE VI
SPRUCE BUDWORM EGG - MASS INFESTATION COUNTS PER 10^2 m IN NOVA SCOTIA BY COUNTY, 1974 TO 1981

County	Year							
	1974	1975	1976	1977	1978	1979	1980	1981
Richmond	125	203	430	649	364	403	423	51
Cape Breton	-	496	1608	524	437	349	378	17
Inverness	468	552	1319	758	389	316	308	50
Victoria	370	676	1832	771	435	647	258	27
Cumberland	293	263	191	71	218	307	235	197
Colchester	24	20	104	23	165	52	10	22
Pictou	-	23	29	125	140	214	116	13
Antigonish	204	135	196	182	252	65	136	79
Guysborough	0	0	6	78	-	8	0	8
Kings	14	12	12	25	73	183	245	86
Annapolis	19	16	18	27	121	165	224	72
Hants	36	11	6	6	0	19	61	12
Digby	12	6	11	20	-	3	86	36
Halifax	0	37	0	5	-	0	30	24
Lunenburg	0	6	0	6	9	16	10	15
Shelburne	0	3	0	12	-	8	28	4
Queens	0	3	4	4	0	0	-	6
Yarmouth	0	0	16	20	-	28	29	4

TABLE VII
PERCENT FOLIAGE PROTECTION AND PERCENT MORTALITY OF SPRUCE BUDWORM LARVAE (Choristoneura fumiferana [Clemens, 1865]) OBTAINED BY AERIALLY APPLYING A MICROBIOLOGICAL BIOCIDE, Bacillus thuringiensis kurstaki, AT 20 BIU/ha ON MAINLAND NOVA SCOTIA, JUNE 1891

Name	No.	Cover[1] Type	Function[2]	Number of Applications	Area Flown[3]	Larvae Instar	Mean No. of Larvae 43 cm	Foliage Protection % Saved	Accept.	% Larval Mortality
Advocate	1	rS	1	1	1 752.5	4-5	17.6	63	yes	79.3
Shulie	2	rS	1	1	1 869.0	4-5	19.2	69	yes	80.0
Moose R.	3	rS	1	1	4 586.0	4-5	16.7	68	yes	80.7
Economy	4	rS	1	1	2 321.5	3-5	9.0	77	yes	81.4
		bF	1	-	-	-	9.2	71	yes	84.7

1. Cover type based on Quebec system, wS - white spruce, bF - balsam fir, rS - red spruce
2. "1" is foliage protection areas, "2" is seed protection area
3. Determined from navigator reports (hectares)

TABLE VIII
SUBJECTIVE ASSESSMENT OF FOLIAGE PROTECTION OBTAINED WITH THE AERIAL APPLICATION OF A MICROBIOLOGICAL BIOCIDE (Bacillus thuringiensis kurstaki (20 BIU/ha)) AGAINST SPRUCE BUDWORM LARVAE (Choristoneura fumiferana (Clemens, 1865)) CAPE BRETON ISLAND, NOVA SCOTIA, 1981

Name	Block Numbers	Cover[1] Type	Function[2]	Number of Application	Area[3] Flown ha	Larval Instar	Foliage[4] Protection
Hume Bk.	5	bS	1	1	809.0	3-4	Positive
Gairlock Mtn.	6, 7, 8	bS + bF	1	1	9 713.9	3-4	Positive
Round Mtn.	9	bF	1	1	942.0	3-4	?
Christie	10, 11	bF	1	1	487.5	3-4	?
Crowdis Mtn.	12	bF	1	1	2 997.4	3-4	Positive?
Bell Lake	13, 14	bF	1	1	3 982.1	3-4	Positive
Spaced Stands	15, 16, 18, 19, 21	bF	1	1	1 250.0	3-4	Positive
Miners Rd. N	20	wS	2	2	261.1	3-4	Negative
Muskrat Bk.	22	bS	2	2	48.0	3-4	Positive
Hume Rd.	23	bS	2	2	64.8	2-3	Positive
Gairloch Rd.	24	wS	2	2	137.7	2-3	Positive
Miners Rd. S	17	wS	2	1	94.8	2-3	Positive

1. Cover type based on Quebec system, wS - white spruce, bF - balsam fir, rS - red spruce
2. "1" is foliage protection, "2" is seed protection areas
3. Determined from Navigator reports

TABLE IX
EXPENDITURES OF THE OPERATIONAL PROJECT TO SUPPRESS SPRUCE BUDWORM
(Choristoneura fumiferana (Clemens, 1865))
IN SELECTED AREAS BY AERIALLY APPLYING
(Bacillus Thuringiensis Kurstaki)
(20 BIU/ha) NOVA SCOTIA,
SEPTEMBER 30, 1980 TO SEPTEMBER 30, 1981

Category	$	%	Area (ha)	Flown
Salaries	173,113.98	15.75	5.62	5.55
Travel	17,057.45	1.55	0.55	0.55
Special Services	71,467.71	6.50	2.32	2.29
Supplies and Services	760,439.00	69.17	24.72	24.38
Biocide	267,130.48	24.30	8.69	8.56
Aircraft	429,847.05	39.10	13.98	13.78
Lodging	31,095.46	2.83	1.01	1.00
Rentals	16,543.79	1.50	0.54	0.53
Trucking	15,822.22	1.44	0.51	0.51
Equipment	21,266.45	1.93	0.69	0.68
Others	56,034.01	5.10	1.82	1.80
Total	1,099,378.60	100.00	35.54	33.08
Total Area			30 752.4	31 195.0

TABLE X
SUMMARY OF SILVICULTURE AND RELATED COURSES 1981-82

Title	Location	Date	No. Trainees	Contents
Chainsaw - Use and Maintenance	Weymouth	Apr. 14-15	12	Chainsaw maintenance and minor repairs; filing, safe work techniques for felling, limbing and bucking.
"	Kentville	Apr. 15-16	10	"
"	Coxheath	May 7-8 12-13; 14-15; 25-26	20	"
"	St. Peter's	May 28-29 June 1-2	10	"
"	Baddeck	June 4-5; 8-9; 10-11	15	"
"	Whycocomagh	June 15-16 17-18	10	"
"	Digby	July 7-9	6	"
"	Athol	July 13-15	6	"
"	Pugwash	July 17-20,12	6	"
"	Mid-Musq.	July 28-30	6	"

TABLE X (continued)

Title	Location	Date	No. Trainees	Contents
" and Farm Woodlot Management	Truro	Feb. 22-26	9	Same plus Woodland Safety and First Aid; Introduction to Silviculture techniques and regeneration harvesting methods.
Chainsaw Instructors	Waverley	Jan. 4-8	7	Chainsaw safety; maintenance of the cutting assembly and saw engine; safe working techniques for felling, limbing and bucking while using the bench methods of organized felling.
"	Truro	Jan. 11-15	8	
"	Antigonish	Mar. 22-26	10	
Introductory Soils	Western	May 4-5		Soil formation; origin and identification of rocks and minerals; soil texturing; drainage; relationship with tree growth.
	South-Shore	May 7-8		
	Valley	May 11-12		
	South Central	May 14-15	150	
	C.B. North	June 1-2		
	C.B. South	June 4-5		
	Eastern	June 8-9		
	North Central	June 11-12		
Farm Woodlot Management	N.S.A.C.	Sept. 11-Dec. 12	15	Tree identification and growth; silviculture technique cleaning, thinning and planting, regeneration harvesting methods; maple syrup production; Christmas tree cultivation; forest protection; scaling; access roads and woodlot safety.
Professional Forest Worker Phase I	Masstown	Nov. 30 - Dec. 16	19	Chain saw maintenance; prelimbing, notching, felling, limbing; safety clothing; physical conditioning; first aid; tree identification; recognizing major diseases and insects; firefighting and scaling.

TABLE X (continued)

Title	Location	Date	No. Trainees	Contents
Chainsaw Home Study	Pictou Co.	Feb. 20-Mar. 17	6	Safety equipment and clothing, first aid; maintaining chainsaw cutting assembly and engine; felling, limbing and bucking.
Advanced Christmas Tree Producers	Whycocomagh	Mar. 15-19	40	Chainsaw safety; planting, use of herbicides; foliar and soil analysis; thinning, shearing, harvesting and marketing.
Use of Draft Horses for Commercial Forest Operations	N.S.A.C. Truro	Sept. 15	8	Topic spoken on - Regeneration Harvesting using Shelterwood System.

TABLE XI
NOVA SCOTIA WILD FUR TAKEN AND EXPORTED BY SPECIES, 1932-33 TO PRESENT

Year	Beaver*	Otter	Muskrat	Mink(wild)	Raccoon	Bobcat	Lynx	Fox	Weasel	Skunk	Fisher	Squirrel	Bear*	Coyote
1960-61	7,541	486	22,899	1,996	1,769	555	18	879	2,132	27	--	3,792	174	
1961-62	3,958	409	17,437	1,864	1,028	377	70	906	986	5	--	3,709	139	
1962-63	2,744	360	12,339	1,710	1,672	738	79	1,273	1,172	16	--	5,787	155	
1963-64	2,998	320	21,243	1,990	1,585	657	24	1,109	731	14	--	1,101	162	
1964-65	5,245	404	24,027	1,777	1,386	617	28	2,733	1,010	235	--	9,522	161	
1965-66	2,883	591	22,677	2,312	2,276	1,334	97	2,692	2,988	27	--	2,928	256	
1966-67	4,603	548	20,471	2,256	1,375	1,789	70	2,183	3,445	48	--	11,941	205	
1967-68	2,488	519	17,565	1,536	1,337	1,567	163	1,492	1,161	8	--	1,758	163	
1968-69	4,680	492	19,220	1,643	2,706	1,627	87	1,958	1,242	10	--	1,587	108	
1969-70	3,508	564	29,590	1,908	3,382	1,729	218	2,797	804	34	--	1,035	218	
1970-71	3,766	457	22,484	1,085	1,746	1,659	37	865	805	8	--	1,623	210	
1971-72	3,318	665	24,362	1,882	3,659	1,963	47	2,327	215	6	--	303	175	
1972-73	3,180	610	16,883	1,626	5,346	1,856	30	1,496	403	0	--	1,132	305	
1973-74	3,757	595	38,117	1,777	6,462	1,320	24	1,924	753	6	--	2,583	113	
1974-75	2,494	533	37,751	2,294	5,137	1,947	15	1,513	1,096	2	--	6,121	168	
1975-76	409	202	29,309	2,351	4,715	1,997	0	1,862	1,073	91	--	2,397	249	
1976-77	2,761	721	28,416	2,339	7,121	2,319	0	2,174	675	6	64	6,278	257	1
1977-78	3,075	594	50,406	3,428	7,355	2,423	39	2,397	548	43	34	2,670	271	1
1978-79	2,186	596	39,781	4,107	9,576	3,245	73	3,343	1,268	142	43	3,529	495	2
1979-80	4,130	672	35,946	3,860	10,946	3,170	45	2,908	1,071	76	48	4,385	831	6
1980-81	4,071	592	47,892	3,974	10,181	1,687	0	1,793	1,233	65	31	3,314	863	25
1981-82	3,752	571	51,941	4,362	12,362	1,722	0	2,346	1,148	23	45	1,843	546	78

*Figures for Beaver, Bear and Coyote are not export statistics. Figures for Beaver represent the actual harvest tally. Figures for Bear are those for Bear bountied up to and including 1964; after 1964 they represent calculated bear kill from hunter and trapper reports. Coyote figures are tallied from reported kills.

TABLE XII
NUMBER OF NOVA SCOTIA WILD FUR PELTS EXPORTED FROM THE PROVINCE, AVERAGE PRICES (TO TRAPPER) PER PELT AND ESTIMATED TRAPPER VALUES SPECIES: 1979-80; 1980-81; 1981-82

Species	1979-80 # Exported	1979-80 Average Price	1979-80 Total Value	1980-81 # Exported	1980-81 Average Price	1980-81 Total Value	1981-82 # Exported	1981-82 Average Price	1981-82 Total Value
Beaver	4,130	$ 50.00	$ 206,500.	4,071	$ 35.05	$ 142,689.	3,761	$ 22.46	$ 84,472.
Muskrat	35,946	6.00	215,676.	47,892	7.03	336,681.	51,941	4.30	223,346.
Otter	672	70.00	47,040.	592	69.87	41,363.	571	50.89	29,058.
Mink	3,861	25.00	96,525.	3,974	25.10	99,747.	4,362	24.49	106,825.
Lynx	45	200.00	9,000.	0	227.81	-	0	-	-
Bobcat	3,170	140.00	443,800.	1,687	139.98	236,146.	1,722	155.28	267,392.
Fox	2,908	75.00	218,100.	1,793	71.54	128,271.	2,346	58.47	137,171.
Raccoon	10,948	40.00	437,920.	10,181	41.77	425,260.	12,362	27.36	338,224.
Weasel	1,071	1.00	1,071.	1,233	0.65	801.	1,148	1.21	1,389.
Squirrel	4,385	1.00	4,385.	3,314	0.86	2,850.	1,843	0.90	1,659.
Skunk	76	2.00	152.	65	2.89	188.	23	3.50	81.
Fisher	48	130.00	6,240.	31	126.15	3,911.	45	160.02	7,201.
*Black Bear	36	65.00	2,340.	39	57.80	2,254.	13	41.00	533.
Coyote	2	34.00	68.	17	58.50	994.	78	28.87	2,252.
TOTAL			$1,688,749.			$1,421,155.			$1,199,603.

* Actual bear harvest 1981-82: 546

TABLE XIII
NOVA SCOTIA SMALL GAME HARVEST TRENDS: 1979-80, 1980-81 and 1981-82

	Hunters			Harvest			Average Harvest Per Hunter		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
Rabbits	28,376	23,928	26,061	532,184	323,336	379,862	18.8	13.5	14.6
Grouse	23,526	21,701	21,529	77,378	76,274	65,514	3.3	3.5	3.0
Wild Pheasant	5,745	5,742	5,430	11,490	13,278	10,822	2.0	2.3	2.0
Preserve Pheasant	625	612	517	2,188	2,446	1,773	3.5	4.0	3.4
Total Pheasant	6,370	6,354	5,947	13,678	15,724	12,595	2.1	2.5	2.1
Hungarian Partridge	860	883	702	1,641	2,004	1,071	1.9	2.3	1.5
Woodcock	2,267	2,107	1,515	5,823	5,537	3,360	2.6	2.6	2.2
Snipe	1,915	1,767	1,256	3,478	6,351	2,216	1.8	3.6	1.8
Total of Upland Game	31,690	28,801	29,843	634,182	429,226	464,618	20.0	14.9	15.6
Black Ducks	10,111	10,027	9,863	41,694	60,454	41,711	4.1	6.0	4.2
Sea Ducks	5,001	4,358	4,352	27,941	28,533	20,608	5.6	6.5	4.7
Other Ducks	7,176	6,153	5,895	26,256	34,732	18,403	3.7	5.6	3.1
Geese	5,164	5,036	4,631	10,002	8,524	3,693	1.9	1.7	0.8
Total Waterfowl	11,904	11,961	11,516	105,893	132,243	84,415	8.9	11.0	7.3

TABLE XIV
KELLY LAKE FISH CULTURE STATION
STOCKING LIST BY COUNTY AND SPECIES, 1981

Yearling Speckled Trout

HALIFAX COUNTY		
Shubenacadie River		
Barrett Lake	(4449 6341)	500
Salmon River		
Partridge River	(4442 6324)	1,000
Lawrencetown Lake	(4442 6323)	1,000
Lake Echo	(4444 6323)	2,000
Lake Echo Pond	(4444 6323)	1,000
Martin Lake	(4444 6324)	1,000
Otter Lake	(4446 6324)	2,000
Lewis Lake	(4445 6323)	1,000
Eagle Lake	(4445 6327)	1,000
Salmon River	(4445 6323)	1,000
Chezzetcook Inlet		
Little Lake	(4445 6316)	1,000
Chezzetcook River		
Bridge End Lake	(4447 6312)	2,000
Petpeswick Lake	(4445 6311)	1,000
Conrod Lake	(4446 6316)	2,000
Chezzetcook Lake	(4447 6314)	1,000
Jeddore Harbour		
Abraham Lake	(4447 6259)	2,500
Clam Bay		
Muskrat Lake	(4446 6257)	1,000
Grassy Lake	(4446 6257)	1,000
Ship Harbour River		
Philip Lake	(4456 6250)	1,000
Newcombe Brook		
Bar Rock Lake	(4448 6247)	1,000
Lily Pond Lake	(4448 6247)	1,000
Tangier River		
Copper Lake	(4448 6241)	1,000
Long Lake	(4503 6257)	1,000
Third Lake	(4451 6241)	1,000
Granite Lake	(4452 6241)	1,000
River Lake	(4455 6245)	1,000
West River (Sheet Harbour)		
Big Brook Lake	(4457 6233)	1,000
Coon Lake	(4456 6234)	1,000
Lower Beaver Lake	(4501 6246)	1,500
East River (Sheet Harbour)		
Grassy Lake	(4511 6233)	1,000
Cruickshank Lake	(4512 6234)	1,000
Fifteen Mile Stream	(4506 6230)	2,000
Halfway Brook	(4454 6227)	1,000
Lower Lake	(4452 6226)	1,000

Beaver Harbour			
Lily Lake	(4452 6226)	1,000	
Greenbrook Lake	(4454 6225)	1,000	
Quoddy Inlet			
Goose Pond	(4455 6220)	1,000	
Gammon's Pond	(4454 6221)	1,000	
Moser River			
Kelly Lake	(4503 6220)	4,000	
Kindervater Lake	(4503 6218)	1,000	
Bear Lake	(4502 6218)	2,000	
Round Lake	(4504 6220)	2,000	
Mill Lake	(4454 6216)	1,000	
Jewer Cove (Ecum Secum West)			
Church Lake	(4452 6211)	1,000	
GUYSBOROUGH COUNTY			
Marie Joseph Harbour			
Louse Hill Lake	(4458 6206)	1,000	
Pye Lake	(4458 6206)	1,000	
Gaspereau Brook	(4502 6200)	1,000	
Gegogan Brook	(4505 6200)	950	
COLCHESTER COUNTY			
Stewiacke River			
College Lake	(4512 6248)	2,000	
Moose Lake	(4522 6301)	2,000	
Deyarmount Lake	(4518 6301)	1,000	
Hay Lake	(4518 6301)	1,000	
HANTS COUNTY			
Nine Mile River	(4458 6330)	1,000	
McGrath Lake	(4500 6342)	1,000	
Shubenacadie River	(4505 6305)	1,500	
Brickyard Pond	(4459 6329)	500	
Meander River		1,000	
Pigott Lake	(4456 6353)	2,000	
	Total Yearling Speckles		72,450

Yearling Rainbow Trout

Moser River			
Kelly Lake	(4503 6220)	2,950	
Gaspereau River			
Sunken Lake	(4500 6427)	3,000	
Bay of Fundy			
Rumsey Lake	(4454 6516)	3,000	
	Total Yearling Rainbows		8,950

TABLE XV
FISH AND GAME LICENSE SALES BY COUNTY 1981-1982

County	Res. Big Game ($12.50)	Non Res. Big Game ($75.00)		Res. Small Game ($9.00)	Non. Res. Small Game ($35.00)		Senior Citizen	Res. Fishing ($3.00)	Non Res. Fishing ($15.00)	Fur-Bearers ($10.00)
Annapolis Co.	2,099	11	1	792	7	1	417	2,641	69	293
Antigonish Co.	1,904	40	6	783	1	-	215	1,934	98	236
Colchester Co.	5,022	76	1	1,680	17	-	678	5,399	161	379
Cumberland Co.	4,915	118	7	1,803	16	-	792	4,355	272	587
Digby Co.	3,054	43	4	1,190	5	-	460	1,673	48	222
Guysborough Co.	2,053	50	1	933	1	-	294	1,948	230	293
Halifax Co.	17,755	58	2	7,797	22	-	1,415	21,189	280	546
Hants Co.	3,686	22	1	1,219	6	-	463	4,061	25	341
Kings Co.	3,760	23	-	1,929	18	-	535	4,932	41	340
Lunenburg Co.	5,062	23	-	1,875	1	-	660	4,993	110	362
Pictou Co.	5,237	65	4	1,937	4	-	616	6,902	134	493
Queens Co.	2,139	25	1	965	3	-	360	1,720	81	251
Shelburne Co.	3,061	13	2	1,814	5	-	362	1,317	79	234
Yarmouth Co.	3,638	60	5	1,875	31	9	593	2,258	121	312
Cape Breton Co.	6,796	29		3,688	6	-	668	11,244	122	193
Inverness Co.	2,014	74	6	1,130	4	1	205	2,779	464	212
Richmond Co.	1,153	28	4	771	-	1	156	904	28	125
Victoria Co.	768	15	1	461	2	1	105	847	105	102
TOTAL	74,116	73	46	32,642	149	13	8,994	847	2,468	5,521

TABLE XVI
LAND RECONVEYED TO THE CROWN BY COUNTY, 1981-82

There were 137 reconveyances of land to the Crown located by acreage as follows:

Counties	Hectares	Acres
Annapolis	3 007	7,428
Antigonish	43	107
Cape Breton	146	361
Colchester	876	2,164
Cumberland	165	407
Digby	52	128
Guysborough	206	508
Halifax	383	946
Hants	0	0
Inverness	271	607
Kings	93	230
Lunenburg	444	1,097
Pictou	33	80
Queens	91	224
Richmond	57	140
Shelburne	1 209	2,987
Victoria	41	100
Yarmouth	45	112
TOTAL	7 162	17,689

TABLE XVII
LANDS RECONVEYED TO THE CROWN BY PURPOSE, 1981-82

	Hectares	Acres
Timber Reserve	6 041	14,921
Recreation	325	802
Industrial	31	77
Ducks Unlimited	141	346
Right of Way	4	10
Protected Area	570	1,408
Park Reserve	26	65
Provincial Park	5	13
New Road Construction	1	3
Reserve Land	14	35
Mine	3	8
Parking Lot	0.4	1
TOTAL	7 162	17,689
Expropriation	633	1,563
Transfer of Administration and control	0.4	1

TABLE XVIII
LOCATION OF CROWN LAND
AS FOR MARCH 31, 1982

Counties	Hectares	Acres
Annapolis	44 572	110,093
Antigonish	19 711	48,685
Cape Breton	48 167	118,973
Colchester	50 660	125,129
Cumberland	61 601	152,154
Digby	74 728	184,578
Guysborough	201 967	498,858
Halifax	186 480	460,605
Hants	37 021	91,443
Inverness	122 376	302,268
Kings	31 817	78,588
Lunenburg	37 062	91,543
Pictou	41 500	102,505
Queens	56 517	139,597
Richmond	39 117	96,620
Shelburne	104 302	257,626
Victoria	136 097	336,159
Yarmouth	108 961	269,133
TOTAL	1 402 656	3,464,557

TABLE XIX
FOREST MANAGEMENT PRIVATE LANDS* SUMMARY
TO MARCH 31/82: ASSISTANCE

	50-5,000 Acres		5,000 Acres Plus		Pulp and Paper Co.		Total	
Category	Unit	Assistance	Unit	Assistance	Unit	Assistance	Unit	Assistance
Access Roads								
- Built	178.9 mi (288.6 km)	697,363		N-A N-A		N-A N-A	178.9 mi (288.6 km)	697,363
- Under Const.	245.4 mi (152.0 km)	325,755		N-A		N-A	132.4 mi (213.5 km)	325,755
Boundaries	406.7 mi (656 km)	243,127		N-A		N-A	406.7 mi (656 km)	243,127
Fire Ponds	164	31,618		N-A		N-A	164	31,618
Silviculture	11,348 acres (4 594 ha)	1,461,702	2,806 acres (1 136 ha)	349,231	41,386 acres (16 755 ha)	2,062,662	55,540 acres (22 486 ha)	3,873,595

* Group Ventures not included in the above.

TABLE XX
FOREST MANAGEMENT PRIVATE LANDS* PROGRESS REPORT
BY SUBDIVISION TO MARCH 31/81 APPLICATIONS

Forest Management Plans
Small Individual Woodlots

Subdivision	Total	Applications on File	Being Processed	Completed and Signed	Completed and Signed (Acres)	(Hectares)
Cape Breton North	199	22	0	177	29,610	11 988
Cape Breton South	255	30	22	203	26,824	10 860
Eastern	595	225	6	364	78,618	31 829
North Central	288	105	0	203	41,116	16 646
South Central	276	18	20	238	50,568	20 473
Valley	332	24	29	279	51,986	21 047
South Shore	351	21	4	326	64,279	26 024
Western	272	40	2	230	46,266	18 731
TOTAL	2,568	485	83	2,000	389,267	157 598

* Group Ventures not included.

TABLE XXI
FOREST MANAGEMENT PRIVATE LANDS SUMMARY
BY SUBDIVISION TO MARCH 31/82:
ROADS

Subdivision	Under Construction		Assistance Dollars	Completed		Assistance Dollars	Total		Total Assistance Dollars
	miles	km		miles	km		miles	km	
Cape Breton North	14.3	23.0	44,617	27.0	43.5	123,675	41.3	66.5	168,292
Cape Breton South	9.3	15.0		10.9	17.7	46,978	20.2	32.7	46,978
Eastern	45.3	73.1	137,185	27.7	44.6	78,678	73.0	117.7	215,863
North Central	7.4	12.0	6,517	32.2	51.9	128,804	39.6	63.9	135,321
South Central	41.5	66.9	90,485	15.8	25.5	60,483	57.3	92.4	150,968
Valley	13.7	22.1	9,034	22.8	36.8	78,677	36.5	58.9	87,711
South Shore	8.3	13.4	11,791	28.9	46.6	103,547	37.2	60.0	115,338
Western	11.8	19.1	25,946	13.7	22.0	76,521	25.5	41.1	102,467
TOTAL	151.6	244.6	325,575	179.0	288.6	697,363	330.6	533.2	1,022,938

TABLE XXII
FOREST MANAGEMENT ON PRIVATE LANDS* SUMMARY
BY SUBDIVISION TO MARCH 31/82:
SILVICULTURE

	Boundaries			Fire Ponds		Silviculture		
Subdivision	Miles	Kilometres	$ Assistance	Number	$ Assistance	Acres	Hectares	$ Assistance
Cape Breton North	55.9	90.0	$ 41,148	14	$ 2,745	591.6	239.5	$ 86,837
Cape Breton South	65.8	106.0	54,554	11	2,200	1,420.7	575.2	163,441
Eastern	82.6	133.0	58,687	43	8,259	2,607.8	1 055.8	265,060
North Central	43.6	70.2	16,506	22	4,174	2,021.4	818.4	301,372
South Central	54.3	87.5	25,218	10	1,855	743.0	300.8	114,872
Valley	24.6	39.6	9,823	10	1,783	1,332.2	539.4	206,161
South Shore	56.6	91.2	28,600	38	7,402	1,246.6	504.7	116,430
Western	407.6	38.9	8,587	16	3,200	1,384.2	560.4	207,528
TOTAL	407.6	656.4	$243,123	164	$31,618	11,347.5	4 594.2	$1,461,701

* Group Ventures not included.

TABLE XXIII
GROUP MANAGEMENT OF PRIVATE LANDS, 1981-82
PROGRESS REPORT SUMMARY

Group	Operating Costs ($) 1981-82	No. of Mgmt. Plans as of Mar. 31-82	Total Area under Management as of Mar. 31-82 (acres)	Av. Size of Ownership (acres)	Total Merchantable Volume (000 ft³)	Ave. Volume Per Acre (ft³/a)	Road Construction (miles)	Boundary Lines (miles)	Ponds (No.)	Silviculture (acres)	Forest Imp. Expenditures ($) 1981-82	Volume of Wood Sold (ft.³) in 1981-82	Commission Contribution ($) in 1981-82
West Pictou	69,350	124	15,000	121	20,520	1,368	7.0	20.6	7	407	144,723	166,917	2,912
North Nova	54,280	64	16,831	263	20,200	1,200	15.0	19.0	1	365	230,818	84,176	2,435
Baddeck	54,910	78	11,305	145	13,700	1,212	14.5	35.0	-	417	167,381	249,735	5,738
La Foret	54,982	79	4,920	62	6,304	1,281	1.1	25.8	-	311	102,802	130,390	3,399
													562
													3,961
North Mtn.	55,000	66	5,668	86	5,588	986	14.3	14.6	8	610	161,122	194,345	2,657
Sissiboo	55,541	69	10,574	153	8,960	847	9.0	27.7	1	407	173,055	181,560	4,239
Conform	63,607	80	15,271	191	26,755	1,752	19.6	42.1	5	992	446,484	845,312	11,119
Athol	52,780	33	11,672	354	12,856	1,101	13.8	5.4	7	294	173,786	189,201	3,714
1981-82 Totals	$460,450	593	91,241	154	114,883	1,259	94.3	189.6	29	3,803	$1,600,171	2,041,636	$36,775

TABLE XXIV
SUMMARY OF HUNTING AND RELATED ACCIDENTS STATISTICS, 1981

County	Injury Hunting Accident	Non-Hunting Accident	Fatal	Total By County
Annapolis			1	1
Antigonish				—
Cape Breton		1		1
Cumberland	2			2
Colchester				—
Digby	1		1	2
Guysborough	2			2
Halifax	1			1
Hants	1			1
Inverness				—
Kings				—
Lunenburg				—
Pictou				—
Queens	1			1
Richmond				—
Shelburne	1		1	2
Victoria				—
Yarmouth				—
TOTAL	9	1	3	13

HUNTER SAFETY COURSES	
First Time Firearm Hunters	6,465
Other Firearm Hunters	5,375
Bowhunters	194
TOTAL	12,034
Failures: Firearm	1,212
Bowhunter	NIL
TOTAL	1,212

COURSE GRADUATES INVOLVED IN ACCIDENTS	
Firearm Course	5
Bowhunter Course	NIL
TOTAL	5

GAME BEING HUNTED				TYPE OF WEAPON INVOLVED			
Moose	NIL	Furbearers	NIL	Shotgun	4	Muzzle Loader	NIL
Deer	7	Bear	NIL	Rifle	6	Bow	NIL
Rabbits	5	Unknown	NIL	22 Cal.	3		
Birds	NIL	Non-Hunting	1				

CAUSES OF ACCIDENTS

Shooter Stumbled and Fell	3	Victim Moved in Line of Fire	NIL
Victim Mistaken for Game	2	Weapon Fell from Insecure Place	NIL
Trigger Caught on Object	NIL	Victim Covered by Shooter Swinging on Game	NIL
Unintentional Discharge	4	Crossing Fence or Obstacle with Loaded Weapon	NIL
Horseplay with Firearm	NIL	Removing Weapon or Placing in Vehicle	NIL
Clubbing Cover or Game	1	Rifing in Vehicle with Loaded Firearm	NIL
Intentional Discharge	2		
Unloading Weapon	NIL		
Defective Weapon	NIL		
Loading Weapon	NIL		
Others	1		
Victim Out of Sight of Shooter	NIL		

COLOUR OF CLOTHING WORN BY VICTIM

White	NIL	Blue	NIL	Yellow	NIL
Red	5	Dark	NIL	Orange Fatal	1
Green	NIL	Other	7	Orange Injury	NIL

TIME OF DAY ACCIDENT OCCURRED

6:30 - 8:00 a.m.	2	12:00 - 4:00 p.m.	2
8:00 - 10:00 a.m.	2	4:00 - 5:00 p.m.	2
10:00 - 12 Noon	3	5:00 - Dusk	2

COVER TYPE		VISIBILITY	
Dense	3	Clear	9
Light	4	Poor	NIL
Open	6	Overcast	3
Unknown	NIL	Dark	1
		Unknown	NIL

VISION		SELF-INFLICTED ACC'D.	
Wears Glasses	1	Fatal	1
Colour Blind	NIL	Injury	5
Unknown	NIL	TOTAL	6

AGE CLASS OF ACCIDENTS

	Shooter	Victim		Shooter	Victim
Unknown	1		31 - 35		
10 - 15		1	36 - 40		1
16 - 20	7		41 - 45		
21 - 25	1	1	46 - 50	2	
26 - 30	1	2	51 -	1	2

CHARGES LAID AS RESULT OF ACCIDENTS

Lands and Forests Act	NIL
Criminal Code	3
# Liquor Involved	NIL

MUZZLE TO WOUND DISTANCE (YARDS)

0 - 10	7
11 - 50	2
51 - 100	3
Over 100	—
Unknown	1

HUNTING EXPERIENCE OF SHOOTER

1 Year	1	4 Years	1	Over 5	—
2 Years	—	5 Years	2	Over 10	4
3 Years	2	Unknown	3		

TABLE XXV
SUMMARY OF OFFENCES, CONVICTIONS AND WARNING BY STATUTE AND COUNTY, 1981

A - OFFENCES KNOWN OR REPORTED B - NUMBER OF PERSONS CHARGED
C - WARNINGS ISSUED

District		L and F Act Part I	L and F Act Part II	L and F Act Part III	Parks Act	Beaches P and P Act	Snow Vehicles Act	MBC Act	Total
	A	---	3	65	---	---	---	---	68
Annapolis	B	---	---	18	---	---	---	---	18
	C	---	3	10	--	---	---	---	13
	A	5	4	49	6	5	---	11	80
Antigonish	B	---	1	16	---	---	---	1	18
	C	---	---	5	---	---	---	---	5
	A	7	38	537	41	11	---	14	648
C.B. Sydney	B	---	1	11	13	1	---	---	26
	C	1	5	83	15	2	---	---	106
	A	---	1	165	---	---	---	---	166
Colchester	B	---	1	21	---	---	---	---	22
	C	---	---	15	---	---	---	---	15
	A	---	---	100	---	---	---	---	100
Cumb. East	B	---	---	19	---	---	---	---	19
	C	---	---	15	---	---	---	---	15

TABLE XXV (continued)

District		L and F Act Part I	L and F Act Part II	L and F Act Part III	Parks Act	Beaches P and P Act	Snow Vehicles Act	MBC Act	Total
	A	---	---	77	1	1	---	---	79
Cumb. West	B	---	---	25	---	---	---	---	25
	C	---	---	22	---	1	---	---	23
	A	2	1	193	5	1	---	1	203
Digby	B	---	---	20	---	---	---	---	20
	C	---	---	23	---	---	---	---	23
	A	8	8	33	---	4	---	10	63
Guysborough	B	---	---	11	---	---	---	3	14
	C	---	---	1	---	---	---	---	1
Halifax East	A	5	5	118	2	---	---	13	143
	B	---	---	5	---	---	---	2	7
	C	---	---	8	---	---	---	1	9
Halifax West	A	11	6	307	126	3	---	25	478
	B	1	1	77	50	---	---	11	140
	C	1	---	27	16	---	3	---	47
	A	1	4	168	17	---	---	---	190
Hants	B	---	---	63	5	---	---	---	68
	C	---	3	31	29	---	---	---	63
	A	---	1	98	---	1	---	---	100
Inverness	B	---	---	28	---	---	---	---	28
	C	---	1	38	---	---	---	---	39

TABLE XXV (continued)

District		L and F Act Part I	L and F Act Part II	L and F Act Part III	Parks Act	Beaches P and P Act	Snow Vehicles Act	MBC Act	Total
Kings	A	2	3	148	2	2	---	2	159
	B	---	2	20	---	---	---	1	23
	C	1	1	83	---	---	---	---	85
Lunenburg	A	2	9	257	14	11	---	5	298
	B	---	3	89	3	---	---	1	96
	C	---	4	40	9	---	---	---	53
Pictou	A	---	2	229	40	1	1	4	277
	B	---	2	50	27	---	1	7	87
	C	---	3	40	---	1	---	4	48
Queens	A	1	15	82	---	1	---	3	102
	B	---	---	13	---	---	---	1	14
	C	---	14	11	---	---	---	2	27
Richmond	A	2	---	60	---	---	---	---	62
	B	---	---	10	---	---	---	---	10
	C	---	---	22	---	---	---	---	22
Shelburne	A	---	6	36	2	4	---	30	78
	B	---	2	13	---	---	---	8	23
	C	---	---	---	2	1	---	9	12
St. Marys	A	---	3	140	2	3	---	8	156
	B	---	---	15	---	---	---	---	15
	C	---	3	54	---	3	---	---	60

TABLE XXV (continued)

District		L and F Act Part I	L and F Act Part II	L and F Act Part III	Parks Act	Beaches P and P Act	Snow Vehicles Act	MBC Act	Total
Victoria	A	---	---	79	---	---	---	3	82
	B	---	---	11	---	---	---	3	14
	C	---	---	37	---	---	---	1	32
Yarmouth	A	---	39	101	9	4	1	4	158
	B	---	2	6	4	---	---	3	15
	C	---	---	12	4	1	---	---	17
Total	A	46	148	3,042	267	52	2	133	3,690
	B	1	15	541	102	1	1	41	702
	C	3	37	577	75	9	3	17	721

# Prosecutions - Jacking	52
# Prosecutions - Uncased guns	60
# Prosecutions - Shining Lights	20
TOTAL	132

POOR

QUALITY

ORIGINAL